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Is Hockey for the Birds?

During the last decade, museums and other cultural organizations have had to be especially aggressive in the pursuit of new audiences. Major exhibitions like *Treasures of Tutankhamun* and complex public programs and marketing strategies, the most obvious manifestation of this trend, have met with varying degrees of success in terms of long-range audience growth and financial gain. Although our cover photo may seem to be the most aggressive thrust yet of a museum into the public domain, the word innovative is more appropriate than aggressive. For the first time in Canada, a cultural institution is joining forces with a sports team to broaden markets for fundraising and audience development.

Is there a natural affiliation between sports and the arts and sciences? As our article reveals, the varied careers and interests of the people from Hockey Canada and the ROM who have agreed to a ROM/Team Canada partnership are proof that such a collaboration is feasible. Premier David Peterson best expressed the association of hockey and the ROM when he made the official announcement of the Future Fund Today—Endowment at the ROM on 24 November 1986. Remembering fondly his childhood visits to Toronto, accompanied by his parents, he said that they always spent the afternoons at the Museum and then attended a hockey game in the evening. Hockey and the ROM: here are two great Canadian institutions whose publics will surely benefit from this timely union.

In this issue of *Rotunda*, we not only discuss sports and culture, we also take a look at birds and culture. Allan Baker shows us that bird species, like humans, evolve both genetically and culturally. He uses the term cultural evolution to describe the development of bird songs. For example, a distinct accent is one of the linguistic traits of a population of New Zealand chaffinches, whose ancestors were brought to that country from England. How birds learn their songs is also fascinating. Birds have a special song template in their brains that expands to increase the capacity for learning during certain times of the year. As Baker suggests, the next time that you call someone a bird brain, you had better think twice about what that means.

Turning to ancient cultures, it may come as a shock (and maybe a relief) to its residents to learn that Toronto the Good is a city with a past. There is increasing evidence of prehistoric Indian occupation dating back more than five thousand years. Toronto, like any other North American city, is not a Rome or a Jerusalem; mounds of ancient artifacts and records do not appear in vast quantity with each excavation for a new building foundation.

Mima Kapches, a ROM archaeologist who is documenting the prehistory of Toronto, explains what we can learn and what will probably be forever lost to us about the prehistoric populations. One site that she describes is the intersection of Bloor and Yonge streets. Trying to imagine the site as an Indian burial ground is extremely difficult, especially when not a trace of a burial ground remains. We know of the Sandhill, as it was called, from one European document. Yet this is a good reminder for the citizens of any city that has changed rapidly that there is a past upon which they are building.

Our last feature story took place "down under" in the vicinity of Alice Springs, Australia, where ROM curators and exhibit designers went reptile hunting. Their objective was to collect specimens for the new ROM surroundorama, a three-dimensional, walk-through display of an Australian desert. The reptiles that they found are easily as exotic as kangaroos and koalas, the more publicized members of the Australian fauna. In fact, there are more reptiles, and more varieties of reptiles in Australia than in any other continent. The ROM team managed to collect specimens of about seventy of the approximately one hundred different species of reptiles to be found around Alice Springs—of course not without some anxious moments and imaginative techniques that Robert Murphy tells us about in his article.

As diverse as our stories are in this issue of *Rotunda*, they reflect a common factor. In the future, all ROM research will be funded through the ROM endowment. Please give this a bit of thought as you are reading *Rotunda*, watching a hockey game, or listening to the birds sing.

S.S.

ROTUNDA

the magazine of the Royal Ontario Museum

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Illuminations 5

Life in the Past Lanes: An Archaeological View of Toronto 18
Mima Kapches

Wonder in Aliceland 26
Robert W. Murphy

Culture and Sports: Museum Marketing with an Entrepreneurial Twist 37
Sandra Shaul

Evolution of Bird Song: Birds Have Culture Too 42
Allan J. Baker

Musers 50

Growing Collections 53

Gallery Glimpses: The Astrocentre in the McLaughlin Planetarium 54

Book Reviews 57

Rotunda Quiz 62

Index to Volume 19 63

Cover: Eddie Goodman, chairman of the Board of Trustees of the Royal Ontario Museum (left), Sam Pollock, chairman of the International Committee of Hockey Canada (right), and three young hockey players are excited about the ROM/Team Canada partnership. Turn to the story on page 37. Photo by John Reeves.

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Continuous Museum Making

PHOTOGRAPHY: DEPT. ROM

What would the ROM be without the dinosaurs? In this detail of a diorama, *Allosaurus valens* approaches a *Stegosaurus* sp.

Because gallery development has been the first priority of the ROM for almost a decade, and will continue to be so into the 1990s, we sometimes forget that what goes into a gallery, whether for permanent display or temporary exhibition, comes from a collection. Gallery development is temporarily our first priority; accumulating artifacts and specimens to study individually and as part of the body of things and knowledge which forms a collection, is the long-term, ongoing priority of any museum like the ROM. Without collections and collecting we would have nothing to put in galleries. Without the research and study of the collections we would have nothing worthwhile to say in any gallery that we could build.

Last spring, together with Lorne Render, Head of Exhibit Design Services, Ron Miles, Head of Education, and Marilyn Cook, formerly with the office of the Associate Director–Curatorial, I attended a rather high-powered conference in Indianapolis, which addressed the topic "communicating with the museum visitor"–the hot subject in the museum world these days. The many new buzz-words hovering around the issue sounded more like life in a beehive than life in a museum. And it is a topic that stings a lot of careless people. It is so easy to become completely absorbed in deep discussions about how people learn, what they respond to visually, what draws people to museums, what messages they do (or do not) take away from their museum experience, what kinds of audio-visual display methods work best, how one should organize a design-display staff team, and the like, that many people—particularly at such a conference—tend to forget what museums are here for in the first place.

After three days of deliberations, I shocked most everyone present with comments that I could not resist: "We are all talking about communicating with the museum visitor as though this is the most important issue, maybe the only issue, faced by a museum. I disagree, especially when I consider the nature and responsibilities of the ROM. Our museum considers communicating with the museum visitor to be our fourth priority. It comes after collecting, preserving the collections, and understanding those collections in order to use them to advance human knowledge. With that done, we figure we have something worth communicating to the visitor, and then we begin to consider how to do it."

One could have heard the proverbial pin drop; the pregnant silence was followed gradually by the clearing of throats. Finally someone said, "Yes. Someday we must have a conference about all that." The talk slowly resumed on such issues as cognitive versus other styles of teaching, didactic galleries versus purely aesthetic presentations, and how we learn from everyone's design mistakes.

Of course I do not wish to argue or even to imply that museum people should not be deeply and professionally concerned about communicating with the museum visitor. Indeed they should be; conferences such as the one in Indianapolis are important. Yet it remains equally true that a museum such as the ROM has no need of galleries if it does not have collections and if research related to the collections is not carried out. Therefore I question the value of discussing communication and collections as separate and unrelated issues.

The section of *Rotunda* devoted to "The Growing Collections" reveals to the reader the very heart of this museum. One might argue that we already have enough in the collections—and know enough about what we have—to build magnificent galleries that will delight the public. But if we adopted that attitude, we would ultimately lose our vitality and wither as a museum. Imagine C. T. Currelly, Edmund Walker, or Bishop White, the founders of the Museum and its first collectors, saying that they had collected and

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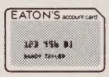

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GREEKS & MACEDONIANS

Ancient Macedonian culture that shaped both Philip and Alexander is apparent in the excavations at Dion, Vergina, Pella and Derveni — all easily reached from a home base at Thessaloniki. Then a visit to the sacred and royal sites of the Peloponnese is to brush shoulders with Greece's mythical past.

Dr. Ian Begg leads this 19-day tour through his favourite Greece in late May.

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studied enough to make a decent gallery of ancient Egypt, or a sufficient presentation of minerals, or a representative display of the arts of China. What would be the fate of the ROM or any other museum if anyone connected with them had made such suggestions?

A museum is not just a warehouse for things indiscriminately collected. Rather, a great museum collects things through purchases, donations in kind, archaeological excavations, and scientific field expeditions in a systematic way so that those individual things—artifacts and specimens—eventually form coherent collections around which a body of new information can be built. In the end the sum of knowledge, beauty, and educational power of a true collection is greater than the parts that were collected. With living collections that grow and change their shape and expand our understanding, a museum stays alive and performs its duty for the future of its society in the same way that in its past it performed for us.

Recently the Royal Ontario Museum announced a fund-raising drive for the establishment of an endowment that will make it possible for the Museum to continue to move into the future with confidence and vitality. By establishing the endowment, the Board of Trustees wisely realized that if this museum is to be true to its long-range mission and not just built for today, then collecting and the collections must have financial support equal to their fundamental importance.

By purchase, by gift, and by hard scholarly work in the field, we plan to make the collections grow. With the sympathetic understanding and the financial help of all who love the ROM, the plan will succeed. And then, in twenty years time, when we begin the systematic updating and upgrading of all those marvellous galleries that we built in the eighties and early nineties, we will have the kinds of living collections that will make such gallery development possible and worthwhile.

T. CUYLER YOUNG, JR

Oranges and Lemons

G. VARLEY

Clementine seedlings are growing in a small pot of moss. Surrounding the pot are grapefruits, lemons, a tangerine, and blood oranges.

Seville is an alluring city, its centre a tangle of picturesque alleys opening out onto spacious squares and avenues. Here, for the first time, I saw orange trees used for civic decoration. Planted close together along the sidewalks of a plaza—round-headed, their leaves a glossy dark green—they held hundreds of glowing fruits and a profusion of blossoms. Even more than the sight, it's the fragrance that lingers in the mind so that now, years later, a whiff of their peculiarly haunting bittersweet perfume instantly conjures up that plaza on a bright November afternoon.

Yet, much as their name is coupled with Seville, oranges aren't native to Spain. They and all the other citrus fruits (with the exception of some modern mutations) originated in tropical and subtropical regions of Asia and Malaysia. In view of the ample evidence that the original citrus was virtually inedible and a rather scraggly plant to boot, why did the Greeks and Romans prize it when it arrived on their shores? Probably they too were smitten with the fruit's perfume and so forgave the thick rinds, scant, bitter flesh, and numerous seeds. Theophrastus mentioned the citron for the first time around 310 B.C., lauding the "exquisite odour" of its fruit, and noting that a decoction of its pulp was an antidote to poison and "also sweetens the breath".

By the time Dioscorides wrote his treatise on *Materia Medica*, sometime around A.D. 60 to 79, citrons were well-established in his district, and Pliny, in his *Natural History*, described the plant's continued use as a medicine, poison antidote, perfume, and moth repellant. In Pliny's time the citron was considered an exotic, perhaps because Italy, along with Greece and France, was apparently much colder then. As the Mediterranean climate moderated during the next century or two, citrus trees began to thrive. By the 3rd century, a Greek writer described methods of cultivation and noted—shades of our cold frames and greenhouses—that trees were covered at the approach of winter in the chillier areas.

The orange is thought to be the next of its genus to reach Europe, fol-

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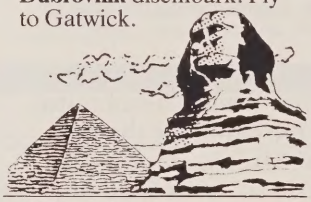

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lowed by the lemon. The orange or *naranj* was known to the Arabs, and though they may not have been the ones to introduce it from India, they certainly expanded its culture around the Mediterranean. The earliest known reference to the lemon is in Chinese records which, around 1175, describe the *li-mung* as "the size of a small plum; again it resembles a small orange and is exceedingly sour to the taste". As for lemonade, it is first referred to in 1299 as an invention of the Mongolians.

Lemons and oranges made their way to England with the Crusaders. Lemon sallet—consisting of sugar scraped from a solid loaf onto the sliced fruit—was a favourite in Shakespeare's time, along with apple and orange tart, and capon with lemon sauce. By the early 1600s, oranges were being grown under glass, mainly for flowers and greens. John Evelyn was adventurous enough to recommend young lemon and orange seedlings as excellent ingredients for salads. And indeed they are quite palatable, having the slightly bitter pungency associated with the fruit's peel.

Mandarins, whose arrival in cunning little wooden crates has come to herald winter festivities, encompass everything from Temple oranges to the decorative calomondin, and Ugli fruit. Ugli fruit, by the way, a natural tangelo (a mandarin/grapefruit cross), got its curious name when it was dubbed "the ugly citrus fruit" in our own Canadian market. A slight change of spelling and Ugli caught on, becoming the copyrighted trademark of G. G. R. Sharp, now the principal, and formerly the only, Jamaican exporter. This unattractively bumpy yet delicious fruit is thought to have sprung from a chance seedling. It was noticed in Jamaica in 1914, propagated, and first exported in 1934.

Various citrus trees were introduced to Florida in the mid-1500s by Spanish explorers and colonists, and were probably carried to California by Fra Junipero Serra around 1769. But the vast groves in those states, from which much of our present cit-

rus supply derives, are very much a modern phenomenon. Shipment to the north began around 1880. For many years, fresh fruit formed the bulk of this trade, but after World War II, processed forms—mainly juice—took over. Now most of the crop ends up this way.

The discovery of vitamin c in 1912 can be credited with really changing the public's perception of citrus fruits. Since citrus fruits are rich in naturally occurring ascorbic acid, they quickly came to be seen as a nutritional necessity, rather than an optional indulgence. Western physicians had known since at least 1600 that citrus fruits could prevent and cure scurvy, a disease which was killing more seamen than all their enemies combined. What they didn't know was *why*. They tried hard to discover another substance that would be cheaper and more convenient, but these experiments ended in failure. At the end of the 18th century, the British navy gave up trying and began issuing a set ration of lemon juice to its sailors. By the mid-19th century this was changed to lime juice (hence the pejorative "limey"), but this didn't work as well because limes have considerably less vitamin c than either lemons or oranges.

Of the many sweet eating oranges, perhaps the most sought after is the blood orange with its rich deep rose to wine-red flesh and darker rind. This unusual coloration, the result of both good luck and good management, usually develops best on fruit that is kept partially shaded and grown in a hot, arid climate. Some varieties produce coloured fruit more readily than others, but growers still may resort to picking the north sides of their trees and then the south, so that blood oranges can be packed separately from blond.

No such niceties were practised on those oranges I saw in Seville. They were probably sour, fit only for marmalade or the production of dried peel or oils for flavouring. But with their fragrant beauty brightening the scene, who could possibly care?

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Plant Alert: Watch What You Wear and Drink

PHOTOGRAPHY DEPT, ROM

These three lovely necklaces are made from potentially deadly seeds. The beads are made from (1) castor bean, (2) apricot stone, and (3) precatory bean.

For centuries people have adorned themselves with jewellery made of beads fashioned from colourful seeds and fruits. Unfortunately some of the most colourful seeds are highly toxic and could cause death to anybody who eats or even chews them. Many of the more toxic seeds are grown in the tropics, and it is illegal to import them to Canada. Be careful with jewellery made from the following plants.

Crab's eye or precatory bean (*Abrus precatorius*) This is a small, shiny, scarlet and black, oval seed that is about seven to eight millimetres long. The seeds grow on a vine that has sharply pointed compound leaves, growing alternately on the stem. The vine is commonly found in the tropics and in Florida.

Precatory beans contain the phytotoxin abrin, which is one of the most potent toxins known. The toxin is concealed within a very hard seed coat, and therefore the seed must be chewed in order to release the poison. The toxin acts as an irritant to mucous membranes after it is absorbed into the bloodstream. Less than the quantity of poison found in one seed may prove fatal to an adult. Precatory beans are used to make necklaces and other jewellery.

Castor bean (*Ricinus communis*) Castor bean is often planted as an ornamental. The plant has palmate leaves with seven lobes and a spike-like flower that grows from the axil of the leaves. It has both male and female flowers. The seed is oval, about 1.5 centimetres long, and mottled light and dark brown in colour.

Castor bean contains the phytotoxin ricin, which causes clotting of the blood. In its pure state, ricin also is one of the most toxic substances known. The toxin is contained in the seed and the foliage of the plant. Although castor oil is extracted from the same seed for medicinal use and as an industrial lubricant, it is not poisonous because the toxin is insoluble in oil. The seed is used for making necklaces and it is fatal to those who chew it.

Apricot (*Prunus*) The stones are often dyed and strung into necklaces. The seeds enclosed within the stones contain cyanide, as do the seeds of cherries and peaches, fruits belonging to the same genus. If many seeds are eaten or chewed, they will cause nausea and may even prove fatal to their victims.

Herbal teas have become increasingly popular in recent years. The flowers, leaves, and bark of all kinds of plants are brewed into hot beverages. However, not all plants are suitable for making tea. For example, tomato leaves contain solanine, which can cause nausea and dizziness. The fairly substantial quantity of tomato leaves needed to brew a normal serving of tea is very toxic.

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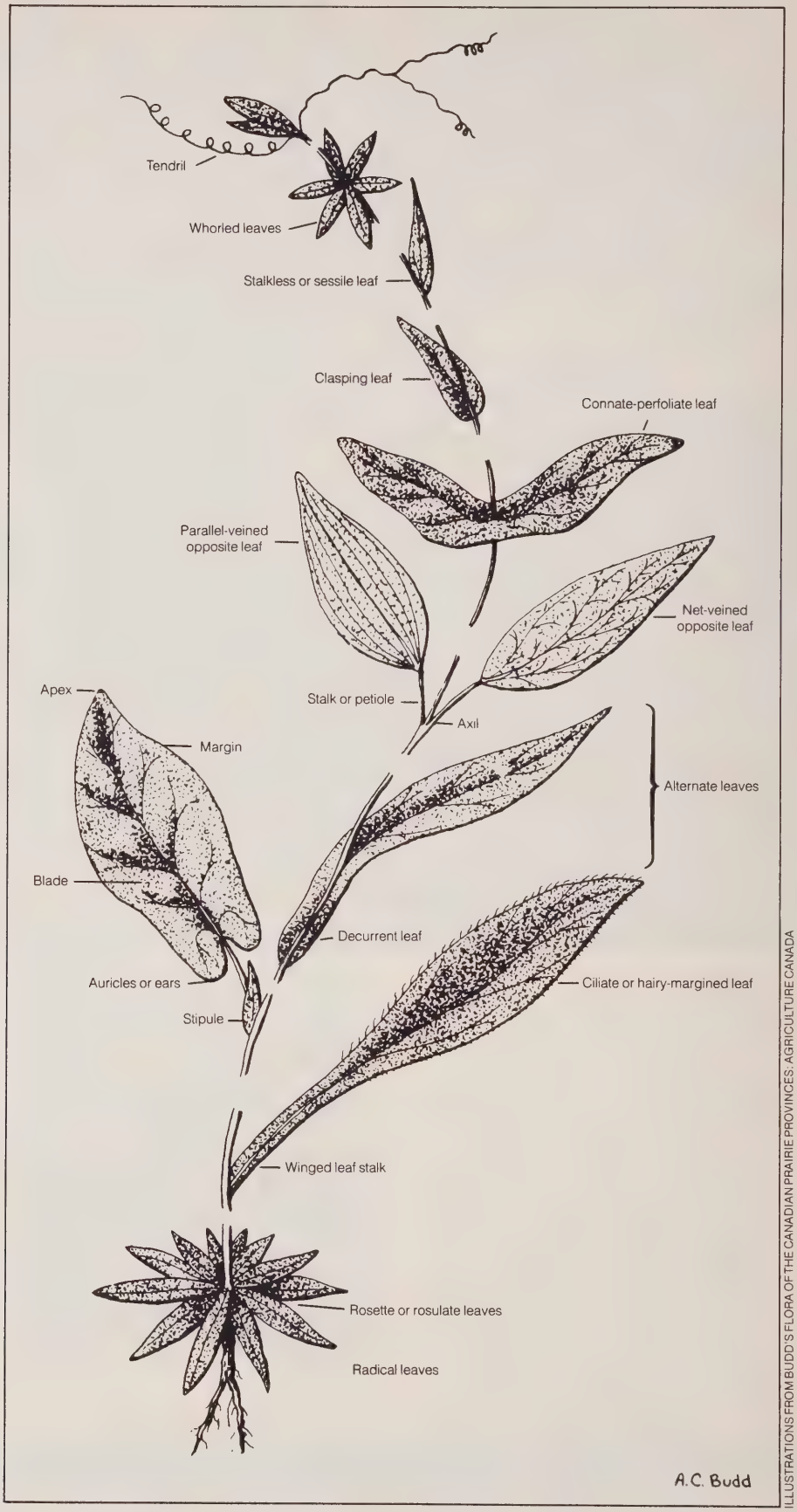

ILLUSTRATIONS FROM BUDD'S FLORA OF THE CANADIAN PRAIRIE PROVINCES: AGRICULTURE CANADA

Leaf variations

Opposite page:
Top: Shapes of simple leaves
Middle: Types of divided leaves
Bottom: Types of inflorescences

The list of plants mentioned in the "Plant Alert" articles is by no means exhaustive; it represents plants that we may commonly encounter in north-eastern North America. Most poisonous plants are only dangerous if they are eaten in large quantities. However, they should all be treated with a healthy respect and everyone should be able to identify them.

There are many old wives' tales about plants; the most reliable source of information is your local poison control centre. To help accurately identify the plants that may be in question, you may use the accompanying charts, which describe basic plant morphology. The books listed at the end of this article will further assist you to identify the plants in your environment. Learning about plants is fun.

DEBORAH METSGER

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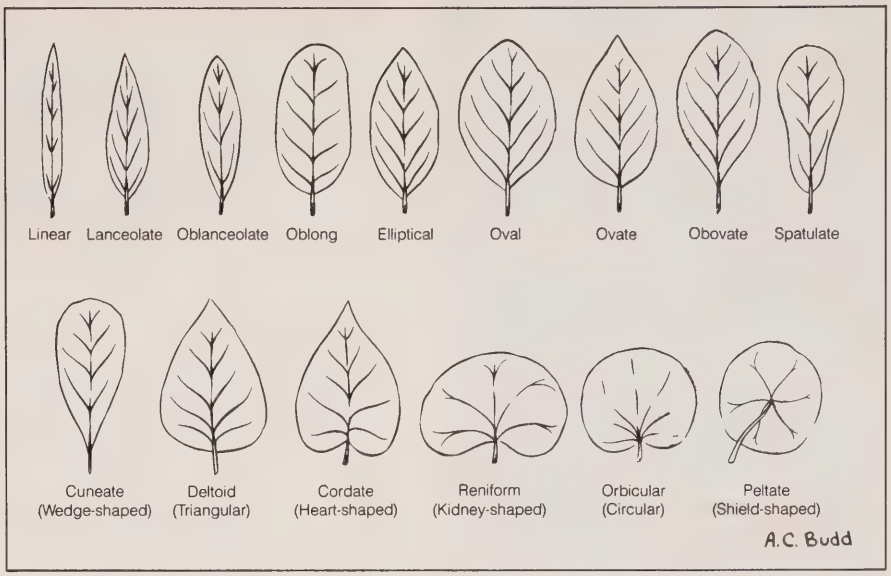

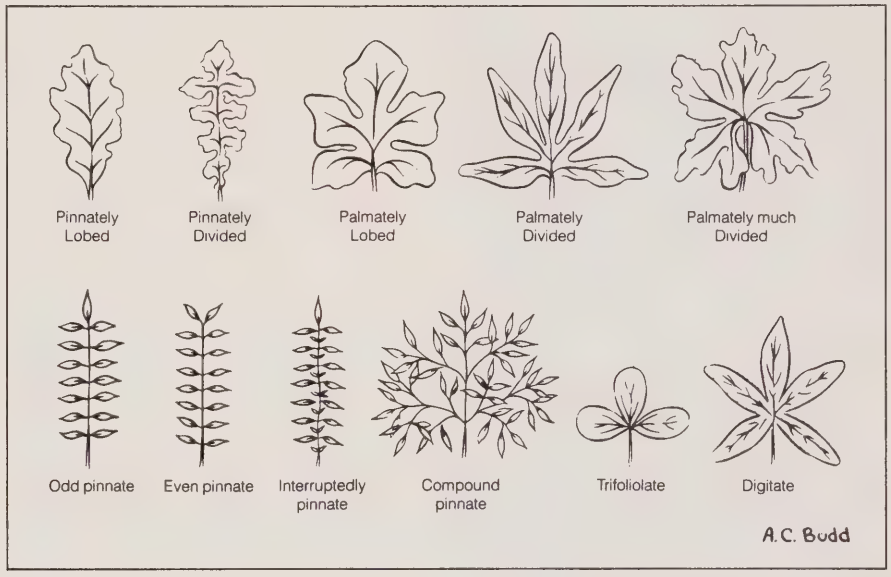

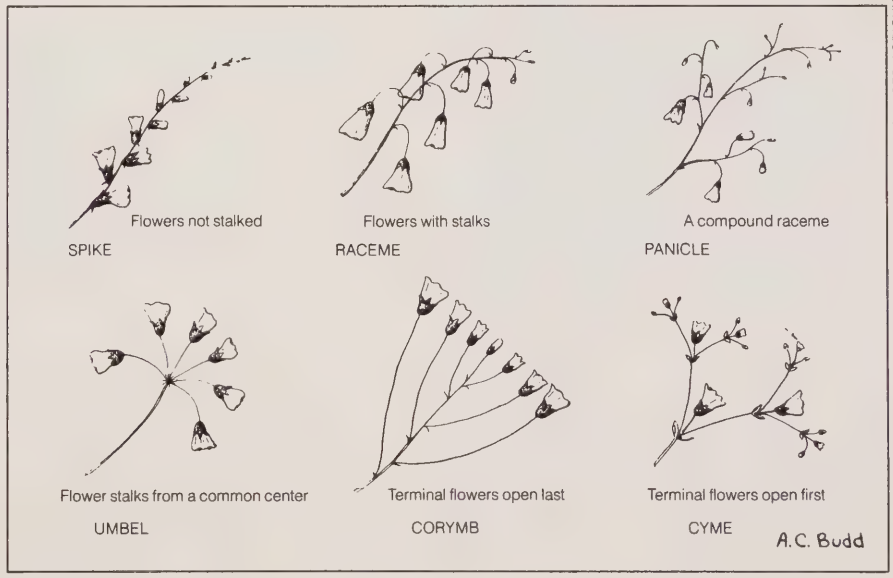

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White Collar Crime in Ancient Egypt

MARIE BERG

DAVID BERG

Top: Artist's reconstruction of part of the hieroglyphic inscription of Thutmose. Thutmose, standing behind the First Prophet of Amen-re, is portrayed with his arms raised as a joyous response to the god's verdict. *Bottom:* Part of the text of Thutmose is inscribed upon these stone blocks from Karnak Temple.

It was the scandal of the year. According to rumour, several officials in charge of the finances of the Temple of Amen-re, King of the Gods, were suspected of embezzlement. The chief accountants had cooked the books, the foremen had padded the payrolls, and managers had reported their affairs in a way that was somewhat less than one hundred per cent accurate. It was also said that the officials had even tampered with the grain measure when paying salaries to the numerous employees of the temple. Thutmose, son of Suawyamen, a bureaucrat of the southern Egyptian government, was accused by the First Prophet of Amen-re of involvement in the crimes. His trial is recorded in an inscription on a stone wall near the tenth pylon (monumental gateway) of Karnak Temple, just to the north of Luxor.

During the 21st dynasty (1069–945 B.C.) southern Egypt was administered by the First Prophet of Amen-re from Thebes (modern Luxor), while the north was governed directly by the pharaoh. The first prophet operated independently, paying only lip-service to the pharaoh; thus there were two complete and separate administrations in the country. Although ancient Egypt had its law courts, judges, and legal codes, occasionally the authorities of a region would appeal directly to a god for a legal decision. The god would render an oracular judgement before many witnesses. Such a trial was requested for Thutmose.

The inscription is difficult to read because of the flaking of the surface of several of the stones and the disappearance of most of the plaster finishing surface. But we can read approximately thirty vertical and sixteen horizontal lines of hieroglyphic text. Beside the vertical lines of text there are carved representations of three carrying-barks with the images of the god Amen-re, his consort, the goddess Mut, and their divine child Khonsu. There are also representations of the various officiating priests, the First Prophet of Amen-re, and Thutmose with his arms raised in the air.

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While we do not yet fully understand the whole text, the general story is clear. Pinedjem II, First Prophet of Amen-re, accused Thutmose and other officials of theft and had them arrested. At a religious festival that took place soon after the arrests, the first prophet asked Amen-re to try Thutmose; the fate of the other officials is not known. During the trial two pieces of papyrus were placed before the carrying-bark of the god. On the first was written: "O Amen-re, King of the Gods, my good lord. One says that there *are* charges against Thutmose the son of Suawyamen, the major-domo, which one is investigating." The second piece of papyrus carried a text that read: "O Amen-re, King of the Gods, my good lord. One says that there *are not* charges against Thutmose the son of Suawyamen, the major-domo, which one is investigating." The god made his decision by choosing one of the documents. Happily for Thutmose, the god chose the papyrus denying all charges. The rest of the inscription details other oracular pronouncements concerning Thutmose.

When the text makes reference to Amen-re choosing, it does not mean that some invisible force violently shook one of the pieces of papyrus. What happened was that a statue of the god, contained in a closed receptacle, was carried on a litter to the appropriate document by several special priests.

But how did the god convey his decision to the priests? Were the priests thought to be spiritually inspired, or are we to believe that the first prophet gave them subtle cues? If the latter is true, did the first prophet believe that his actions were controlled by the god, or did he think of himself as participating in a pious fraud? There are no clear answers to these questions; however, we do know that the ancient Egyptians considered oracles to be true expressions of divine knowledge and therefore useful legal tools.

DAVID BERG

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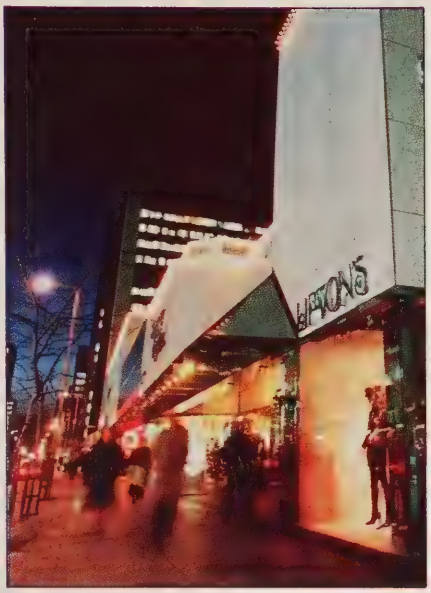

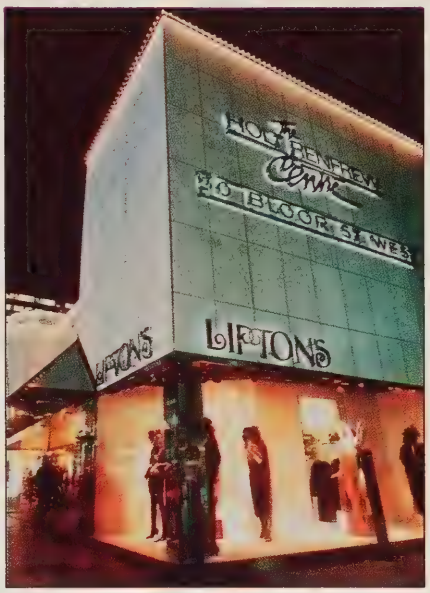

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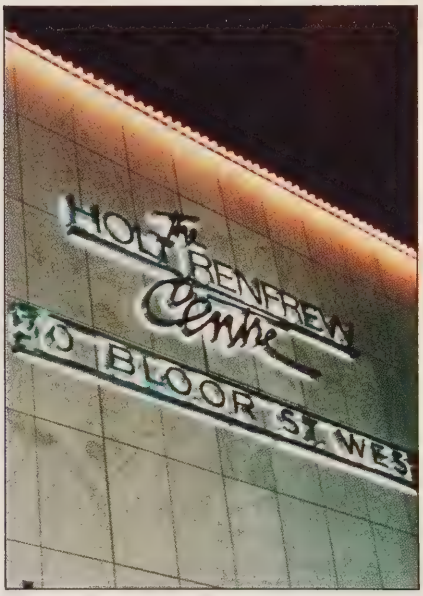

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An Archaeological View of Toronto

LIFE IN THE PAST LANES

It may be hard to imagine but Toronto is a site with a past.

Mima Kapches

The village of Teiaiagon may have looked like this when it was first visited by Father Hennepin in 1678.

THE first European to visit the site of the present-day city of Toronto was Etienne Brûlé in A.D. 1615. While there was no CN Tower to provide a bird's-eye view of the area below, Brûlé enjoyed the captivating view of Lake Ontario as seen from the mouth of the Humber River.

The site in its pristine state must have seemed like a paradise: the Humber River flowing into the lake, the Don and several smaller creeks draining into the harbour, and the quiet, serene, tree-lined vista of the peninsula jutting out into the lake. Wildlife thrived; it was a choice spot for native settlement, just as it would prove to be a natural place for European settlement.

Some one hundred and seventy-five years after Brûlé's visit, Mrs John Graves Simcoe recorded in her diary the wealth and variety of wildlife and plant resources in the little community of York. She wrote of fishing from canoes for salmon; spears were used to catch the fish, and because this was an evening activity, torch-light was used to attract the fish. Her accounts also describe the flocks of wild pigeons that arrived in the spring and autumn, and the many kinds of edible plants that she collected.

KOCSIS

MIMA KAPCHES

Today, stately mansions, beautiful parks, and orderly roads cover the site of Teiaiagon. This area of Toronto is now known as Baby Point.

One can only try to imagine what it must have been like hundreds of years back in prehistory when the countryside was dotted with Iroquoian villages and smaller temporary campsites of many different periods in time. Imagination is one thing, but when the researcher is actually faced with the reality of locating archaeological sites, the entire city takes on a different perspective.

Development and expansion have irrevocably altered the original face of the land. The courses of rivers have been changed, creeks and streams have been buried underground, ravines have been filled in or landscaped, and the harbour has been reduced in size by the addition of fill. Few people fish for salmon or anything else by canoe in the evening anymore, and even fewer eat what they catch.

As a result of the development that has taken place, the search for archaeological remnants of native occupations, both historic and prehistoric, has become a complex process. Historical texts of the city have to be examined and old maps studied; many years of newspaper records, now on microfiche, must be perused; site records and artifact donation data at the ROM and other institutions have to be searched; and finally there are the site locations to be visited, examined, and photographed from the ground and the air. By methods such as these, several thousand years of prehistoric occupations have now been documented. Though there aren't many sites and most are now destroyed, it is apparent that Toronto's location has long been an important area of habitation.

Besides marking the first arrival of a European at the present site of Toronto, the date A.D. 1615 is an important landmark in southern Ontario for another reason. It marks the beginning of the historic period; that is, the period when observations about native life began to be recorded in writing. As the native people did not have a written language, history is distinguished from prehistory in Canada by the existence of European records, the earliest documents having been written by French explorers and missionaries. Native sites occupied after

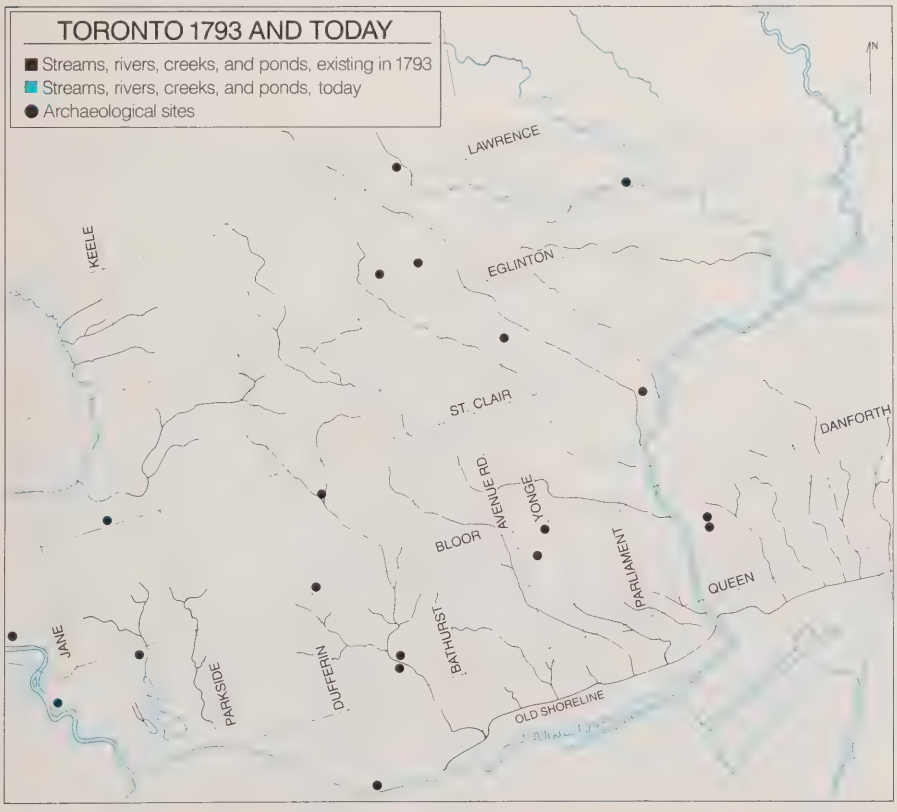
COURTESY CANADIAN DECORATIVE ARTS DEPT, ROM

Toronto Harbour in 1793, print from an original drawing formerly in the collection of Dr Scadding, Toronto. Print in the collection of the Canadian Decorative Arts Dept, ROM.

1615 often contain European artifacts such as iron axes, copper kettles, or glass beads, and so they are considered historic sites.

Brûlé left no written accounts; his exploits are described in the journals of his employer, Samuel de Champlain. Had Brûlé left personal memoirs of his trip there would have been no references in them to village sites that he had seen or visited in the Toronto area. At that time there were no large Iroquoian villages or other permanent habitations. The villages that once existed had been abandoned about A.D. 1550, sixty-five years before Brûlé arrived. It was more than fifty years after Brûlé's historic tour that a large village, Teiaiagon, was established.

Teiaiagon was the subject of the first recorded eyewitness account by a European of native occupation in the area. Father Hennepin visited the village in November 1678 when his ship was caught in stormy weather and he was



VIRGINIA MORIN AND EMIL HUSTIU

forced to find shelter. Hennepin reported that "We barter'd some Indian corn with the Iroquoese, who could not sufficiently admire us, and came frequently to see us on board our Brigantine."

Teiaiagon was well known as an archaeological site before the turn of the century, for many native objects were discovered there by European settlers who arrived in the 18th century to clear and farm the land. It was an historic Seneca village situated on the Humber River about two-and-a-half-kilometres north of Lake Ontario. In modern times this is the location of the former Baby estate, north of Bloor Street and west of Jane Street in the west end of Toronto. The ROM owns some artifacts retrieved from this site; Teiaiagon is also mentioned in several articles and textbooks such as Percy Robinson's *Toronto during the French Régime*.

When visiting a site, one of the many things that archaeologists try to do is get a feeling for the place—its size and the setting. After driving over the 2.5-hectare site many times, looking at the large and stately homes of Baby Point Road, and trying to peer into backyards without being mistaken for a prowler, I still found it difficult to acquire that feeling. Only a helicopter ride over the city allowed a full view of Teiaiagon.

When viewed from the air insignificant details of roads, houses, and swimming pools disappear, and Teiaiagon is revealed as a classic and impressive Iroquoian site. Situated on a high plateau of land and bordered on its north, south, and west sides by the meandering Humber River, it was easily defensible, a characteristic that the Iroquois usually sought for their sites. Objects in the ROM collections ranging from ancient spear points to European glass beads indicate that the site may have been occupied in the prehistoric era until the middle of the 17th century.

When no eyewitness accounts about a native site are available, our only knowledge may come from reports of the discoveries made when the land was being redeveloped. Sandhill is a good example. It was originally described by the Reverend Henry Scadding in 1878 in *Toronto of Old*. The Sandhill was a rise of land where one of Major Givin's Indians was buried after dying a hero's death in the defence of the town of York in 1813. His body was placed "with respect in a grave on the crest of the Sandhill where an ancient Indian burying ground had existed, though long abandoned." Scadding commented somewhat sadly that even at the time of his writing "building requirements have at the present time occasioned the complete obliteration of the Sandhill."

MIMA KAPCHES

Once a prehistoric Indian burial ground, the Sandhill is now obliterated by the busy intersection of Bloor and Yonge streets.

MIMA KAPCHES

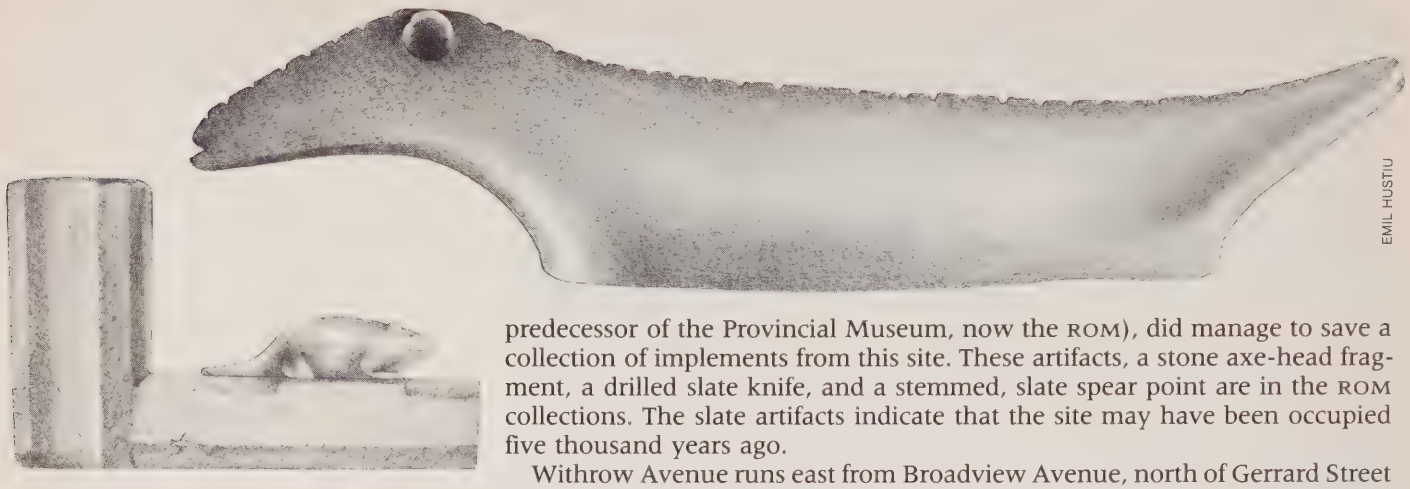
Withrow School (located in the centre of the photograph) covers a prehistoric campsite. The site, situated high upon a hill, offered an excellent view of the Don Valley.

From an archaeological perspective it is the "ancient burying ground" that is of interest. Unfortunately there is no information about who the ancient Indians were or when the burials took place. It is very unlikely that this information will ever be found since many changes have taken place since the obliteration referred to in 1878. Sandhill is thought to have been located west of Yonge Street, south of Bloor Street, where a McDonald's, a movie theatre, and many stores are now standing.

The Withrow site shows how newspaper accounts can provide information about ancient sites. On 28 June 1886, there was a notice in the *Toronto Evening Telegram* concerning the "recent find on Withrow Avenue." "Mr. David Boyle . . . engaged labourers and made a thorough exploration of the ossuary. It is situated on the highest point of land east of the jail . . . upwards of 30 skeletons seem to have been buried in one pit, and as many more in another a few yards off." David Boyle, then curator of the Canadian Institute (the

Below: (From left to right) The slate spear point, drilled slate knife, and stoneaxhead fragment are the only remaining artifacts found at the Withrow site. They were discovered by David Boyle in 1886. The MacGregor point, found in Sunnybrook Park in 1983, shows that Indian artifacts may still be found in Toronto.

COURTESY DEPT OF NEW WORLD ARCHAEOLOGY, ROM



EMIL HUSTIU

Above left: This beautifully carved, stone smoking pipe was found somewhere near Dovercourt Road, and donated to the ROM in the 1930s. The pipe is probably historic Mississauga in origin. *Above right:* This bird stone, dating from about 1000 B.C., was found in the vicinity of Dufferin and Bloor streets on the Quinn farm property. The discovery was reported in 1896.

predecessor of the Provincial Museum, now the ROM), did manage to save a collection of implements from this site. These artifacts, a stone axe-head fragment, a drilled slate knife, and a stemmed, slate spear point are in the ROM collections. The slate artifacts indicate that the site may have been occupied five thousand years ago.

Withrow Avenue runs east from Broadview Avenue, north of Gerrard Street in Toronto's east end, and it was during road construction that the site was found. Its early inhabitants would have had an excellent vantage point from which to view the Don Valley, a short distance to the west.

Finds are still being reported in Toronto. In 1983 the ROM was contacted by Mr Wes McGregor concerning a side-notched spear point that he found in a gravel bed beside a small creek in Sunnybrook Park, located north of Eglinton Avenue and east of Bayview Avenue. Smoothed and worn from being tumbled in the creek over the years, the point, which dates from about 3000 B.C., is possibly evidence that a campsite was once situated in the valley. Needless to say, finding a spear point in a creek bed is equivalent to finding a needle in a haystack.

The archaeology of early historic European buildings in Toronto is also being actively pursued. Ironically, there are large gaps also in our knowledge of the history of European settlement that can only be filled by the excavation of foundations and the analysis of artifacts. In the investigation of historic sites, the Toronto Historical Board has assumed the leading role. Their work at Old Fort York, for example, has revealed information about buildings in the fort that were demolished long ago.

Urban archaeology dealing with historic and prehistoric sites is another aspect of the increasing desire to learn more about Canada's heritage. London, Kingston, and Montreal are three other cities in which excavations are taking place. In many large European cities it is not unusual for excavators to find archaeological sites when digging the foundations for modern construction. Often the sites are complex, and contain metre-deep deposits that have accumulated over thousands of years. In Toronto, where occupation has not been of such long or such permanent duration, the deposits are not buried at a great depth.

In Europe and Asia, places that have been inhabited for thousands of years are remarkable for the hills or tells (large stratified sites) that have grown over the millennia. In southern Ontario, human occupation only began after the retreat of the last ice sheets approximately twelve thousand years ago. During most of this relatively short period of time, in terms of human development, the native peoples were hunters and gatherers living in family groups at small temporary campsites for a week or two. Consequently, for thousands of years sites were very small and were not occupied for any great length of time. It was only during the last six hundred years of native prehistory that villages were established. But even those were shifted from one site to another, and so the constant rebuilding that causes a tell to form did not occur. Artifacts from these sites remained where they were left, very close to the surface.

Unfortunately this means that the artifacts are easily and quickly destroyed during construction, and that many of the known native archaeological sites no longer exist. It is only through historical research that information about the sites and prehistoric and early historic native life comes to light.

Mima Kapches is assistant curator in the Department of New World Archaeology, ROM.

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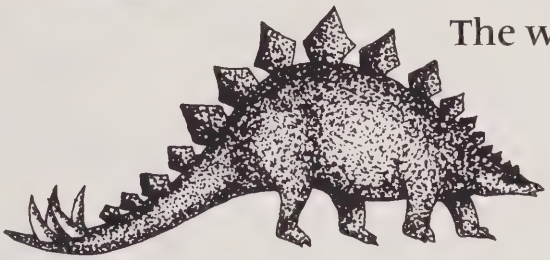

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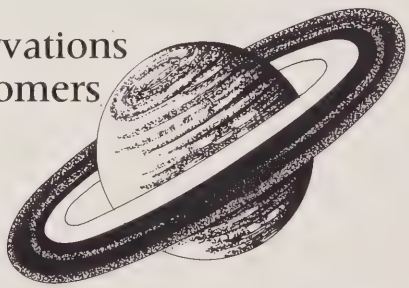

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WONDER IN ALICELAND

Collecting exotic animals and plants is exotic in itself.

Robert W. Murphy

AUSTRALIA'S great variety of animals and plants has captivated the interest and imagination of naturalists for well over four hundred years. When one thinks of Australia, images of eucalyptus trees and bizarre creatures such as koalas, kangaroos, and dingos come to mind, unless you are a herpetologist—someone who studies amphibians and reptiles. Unlike most people, herpetologists will conjure up visions of chasing, or being chased by, goannas (monitor lizards), deadly king brown and tiger snakes, carpet pythons, and numerous other fascinating creatures. Some herpetologists, especially those who study frogs, will think of the gastric-brooding frog, a rare species that "raises" its tadpoles in its stomach.

The ROM's new amphibian and reptile gallery will include a walk-through surroundorama; that is a walk-through diorama. It will depict a central Australian arid zone. Why have we chosen this particular environment? Within a one-hundred-kilometre radius from Alice Springs, there are about one hundred reptile species, a number unmatched on any other continent. There are, by compari-

One of Australia's many exotic reptiles, this animal may be a "Bynoe's" gecko or it may be a member of an all-female species. The species to which it belongs can only be determined by genetic testing.

BILL ROBERTSON

BILL ROBERTSON

Left: The burrowing frog survives the dry seasons by living underground, sometimes more than a metre beneath the surface, in a cocoon formed from its own skin.
Right: Although venomous, the ringed brown snake is not regarded as dangerous. The snake is a member of the genus *Pseudonaja*, which means false cobra.

son, only twenty-five species of reptiles in the entire province of Ontario: fifteen are snakes, nine are turtles, and one is a small lizard. At a single locality in central Australia it is possible to find twenty species of lizards, including one which is almost three metres in length when fully grown. The central Australian reptiles live in and on trees, on cliff faces, hardpan flats, dry river courses, sand dunes, and beneath the ground. There are frogs that survive the dry season by living underground, sometimes more than a metre beneath the surface, in cocoons formed from their own skins; there are snakes with venom ten times more toxic than that of the king cobra, and lizards called thorny devils that look like your grandmother's colourful pin cushion.

The best time to collect animals is in the spring when they begin to emerge from their hibernation sites. Of course, the Australian spring takes place when it is autumn in the northern hemisphere, and so an expedition from the ROM that included Ross MacCulloch, curatorial assistant in herpetology, Peter Buerschaper and Anker Odum, two exhibit design artists, and myself travelled to Australia in October 1985. I had left Canada two weeks before the others. While in Sydney I was overwhelmed by the generosity and support from the Australian Museum. I obtained innumerable ideas from conversations with the staff and from looking at their exhibits, and was made to feel very much at home.

The first few days in Alice Springs were spent arranging collecting permits and securing transportation. With permits in hand, a vehicle, and four days remaining before the rest of the crew arrived in "Alice", I set out to find specific habitats and the appropriate reptiles to depict in the new Australian surround-orama.

While I was preparing for the collecting expedition in Australia, I had contacted several experienced colleagues in North America. They had told me not to expect to find many serpents because they are not abundant in Australia. Most Australian snake species are related to cobras and are very aggressive when they are aroused. Therefore they are very dangerous. Unlike rattlesnakes and many other familiar North American snakes, cobras and their relatives have proteroglyph dentition, meaning that there are two hollow fangs, one on each side of the upper jaw, and these fangs cannot be moved or rotated against the roof of the mouth. The fangs are attached to venom glands, which are modified salivary glands.

Reptile collecting in Australia turned out to be a very different experience from what I had come to expect from my previous work in North American deserts. This was not surprising because the fauna and the habitat are so different. With Carl and Bobby Roth from the Northern Territory Darwin Museum in Alice and Mike Gillam, our field guide/consultant, giving directions, I set out to explore the MacDonnell Ranges at night.

True to Murphy's Law, my first encounter was with a snake, a small species of the genus *Pseudonaja*, whose name means "false cobra". The adrenalin did

Top: A view of the MacDonnell Ranges showing Mitchell grass in the foreground.
Middle: Sand dunes are found throughout much of central Australia.
Bottom: River courses provide homes for many species of reptiles and amphibians.

ROBERT MURPHY

flow that evening, but I was comforted by the words of the Australians: "No worries, mate, she's not too bad of a bloke. You'd only hurt for a couple a days at most." On that first evening, a few specimens of nocturnal geckos were also collected. However, picking up animals off the road at night does not allow adequate assessment either of their habitats or of their habits. The next three days were spent driving hundreds and hundreds of kilometres, day and night, over roads that varied from two-lane asphalt to "jeep" trails with deep ruts and soft sand. Eight sites were chosen for possible reproduction in the ROM gallery.

When the rest of the ROM team arrived, five of the eight sites were finally selected: spinifex flats, sand dunes, Mitchell grass plains, river courses, and cliff faces. While driving to the sand dune location, I was making notes about the arrangements that would permit the local experts to collect and to ship large dangerous snakes to us, when suddenly a large snake, almost two metres in length, rapidly crossed the road in front of us. Murphy's Law had struck again for this was nothing other than a king brown snake. I slammed on the brakes and we jumped from the car to chase it. Peter saw the snake's tail disappear into thick brush on the side of the road. After a few minutes of searching, we focused our attention on a burrow, the underground home of a sand goanna, a fairly large lizard often measuring almost two metres in

Moulding a Termite Mound

ROBERT MURPHY

Termite mounds, made of sandy clay, are strong enough to support tired curatorial assistants like Ross MacCulloch.

Termite hills are only some of the many details that will be included in the new ROM galleries to show the diversity of the flora and fauna of the Australian desert that surrounds Alice Springs. To be more precise, very accurate reproductions of the hills will be included because we could not bring back from Australia real hills, which are heavy, fragile, and full of termites. The reproductions will be made from sturdy rubber latex moulds that Anker Odum and myself carefully created using real hills, sometimes referred to as mounds, that we found while conducting field work in the desert.

The mounds that we found varied in height from twenty-five to seventy-five centimetres. After we decided which two would best serve our purposes, we began the long task of making the moulds by applying layer after layer of liquid latex to the outer surfaces of the mounds. Each layer had to be completely dry before the next one could be applied. Between applications we spent our time working on other matters vital to our documentation of the desert terrain.

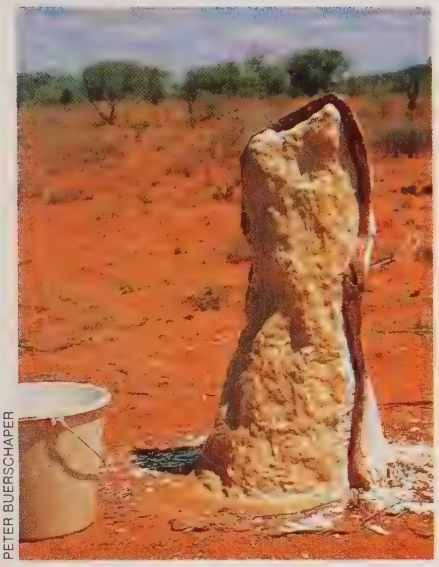
During one such period, Anker decided to paint a full-colour sketch of the termite hill area. With his canvas board in hand and his acrylic paints and brushes laid out, he started to work. Much local colour and character were added to the painting because of the relentless heat and the wind. Each stroke of paint dried almost immediately, and the red desert sand was blown onto the canvas and the pallet where it remained firmly stuck. Needless to say, Anker was never really satisfied with that particular sketch, which he finally left aside in order to return to the task of adding more layers of latex to our termite hills.

By the time we had painted eight or ten layers of latex on each of the termite hills, we were sure that all of the intricate detail was sealed in rubber. Strips of cheesecloth soaked with liquid latex were laminated over the existing layers of rubber. In this way we thickened and reinforced our moulds considerably. We

length. Given the aggressive nature of Australian snakes, we were not sure that we wanted to dig it out even if it was actually in the burrow.

After some digging we found a gecko; the burrow was damp and cooler than the surface of the ground, providing an environment that allowed its residents to conserve energy and water in the arid climate. After more digging we reached the enlarged den of the goanna; the lizard was not at home, but we found the large, hissing king brown snake. As I reminded everyone of the potential vicious response of the snake, it shot its head forward to look around. I placed a large cloth bag into the burrow hoping that the snake would enter it for refuge, a trick that I frequently used for catching rattlesnakes. The king brown quickly emerged, bit the bag, furiously shook its head, and rapidly withdrew into the burrow. We did capture it eventually.

What this incident taught us is not necessarily new to biologists, but the experience gave us a much clearer sense of how to actually convey the natural environment in a museum gallery. We learned, for example, that king brown snakes are active during daylight hours, at least in the spring before the daytime temperatures far exceed forty degrees Celsius. We also learned about the construction of sand goanna burrows. Burrows serve as protection from predators as well as places for capturing prey and escaping the heat of the day. They are also important for the survival of insects, spiders, and other small animals.



PETER BUERSCHAPER

This termite mound was covered with layers of latex, and then wrapped in burlap.

had then to wait for this extra heavy layer of cheesecloth and latex to dry before many more layers of liquid rubber could be added to complete the moulds.

There were also botanical specimens to collect. Within sight of the termite hills, field shrubs with bright green leaves and some small, twisted trees were flourishing. It was almost inconceivable that lush green vegetation could thrive in the dry, hot atmosphere.

For the most part the desert surrounding Alice Springs has little in common with what we normally think of as desert. Although it is dry and hot, an incredible amount of plant life endures. Young, ungrazed mulga bushes grow most everywhere. Here and there a cork tree with its twisted trunk and limbs and its corky bark provides some shade from the scorching sun.

We decided that cork trees, sparsely covered with long, thick leaves like pine needles, simply had to be part of our museum display. Normally we would have made a latex mould of a tree that could be later cast in resin to produce an accurate model. However, our time was running short and our supplies were not plentiful, so we decided to ship a real tree back to the ROM. We chose our tree and sectioned its trunk and major limbs; each of the many pieces was labelled. Smaller branches and leaf samples were also carefully wrapped and packed.

By the time we had finished packing the tree parts, it was late afternoon, and hot. The colours of the desert had intensified. Shrubs, trees, grasses, and the termite hills cast long shadows of violet and purple on the now very orange sand. Before sunset we managed to add several more layers of latex to our two termite mounds. The latex was left to dry overnight and to bake in the next day's sun.

The following afternoon the time had come to collect our moulds. We

PETER BUERSCHAPER

A cork tree is one of the more bizarre plants of Australia.

carefully peeled them away, with little difficulty, from the bottom to the top of the mounds. Ordinarily plaster or fibreglass jackets would have also been made to offer greater support to the flexible rubber moulds. Unfortunately it was not possible to obtain suitable materials in the Alice Springs area, and thus to compensate, we made our moulds extra thick. We now look forward to using the moulds to make several model termite hills for the ROM exhibit.

PETER BUERSCHAPER

While Peter and Anker spent the next few days collecting samples of plants, rocks, and other parts of the selected habitats, Ross and I set out to collect a few specimens of the many reptiles. We had to discover which of the approximately one hundred species lived in each habitat. We found that some animals lived only in one of the very specific environments, while others were less specialized.

Amphibians were not very abundant in the desert, but we did learn of a gold-mining region in the MacDonnell Range where frogs were commonly found in pools of water that formed at the bottom of the mine shafts. After descending into the lower regions of one mine we found two species of "tree" frogs. One of the species, the centralian tree frog (*Litoria gilleni*), is of medium size (about eighty millimetres in length), green in colour, and lives only in central Australia. It is usually found in mountain regions associated with rock surfaces enclosing permanent streams and waterholes. Because there had been no rain in Alice Springs for over a year, most watercourses were dry and consequently frogs were scarce.

The second species, the desert tree frog, is much smaller (about thirty-five millimetres in length), and varies in colour from fawn to brown. The desert tree frog can be found throughout Australia with the exception of the southern parts of the continent. From our vantage point atop a mountain, we could see no other permanent water source, and we were left wondering how these frogs came to find and to live in the mine shafts.

The venom of this large king brown snake is ten times more toxic than the venom of a king cobra.

BILL ROBERTSON

For a period of two days, Alice did receive the badly needed rain. We set off in another direction to spend the nights in arroyos looking for marbled velvet geckos (*Oedura marmorata*). These lizards forage for insects on open rock faces at night and spend the days living in crevices, caves, and overhangs. One evening we approached a cave that had once served as a home for aborigines. We heard a loud chorus of desert tree frogs calling from a group of small temporary ponds. In one pond, actually a small puddle in a large boulder, a children's python lay submerged with only his nose and eyes above water. The snake appeared quite robust, apparently having already fed on a number of unsuspecting frogs which had congregated for breeding. Children's pythons are relatively small pythons averaging less that a metre in length. It was somewhat unexpected to find this snake in the pond because there had been no previous reports of this species feeding on frogs.

ANKER ODUM

BILL ROBERTSON

ROBERT MURPHY

BILL ROBERTSON

This centralian tree frog was found at the base of a mine shaft.
Above left: The marbled velvet gecko forages for insects on open rock faces at night.
Below left: This children's python may have just finished a hearty meal of tree frogs.

Although we never found marbled velvet geckos that night, we did observe a great abundance of geckos of the genus *Heteronotia*. Some populations of these geckos consist entirely of females that are able to produce offspring by parthenogenesis; that is without being fertilized by males. They give birth only to female offspring. The evolutionary advantage of this process is that a species is able to fill the available habitat very quickly after an environmental disaster because every animal is able to reproduce more animals. No energy is spent on the production of males. The disadvantage is that all the animals are clones of the parents. If the original ancestor is poorly suited for adapting to environmental change, so are all the generations of offspring. Therefore it is extremely difficult for parthenogenic species to change with time, to evolve. We could not be certain if the population that we had found was the all female species, the male and female species, or a mixture of the two. A genetic test that determines the number of chromosomes present in each individual must be performed in order to identify the unisexual species.

During the four weeks of our trip we managed to collect and to photograph representatives of almost seventy species of amphibians and reptiles, including tiny legless lizards that live in sand dunes, a carpet python that was approximately a metre-and-a-half in length, our king brown snake, thorny devils, blue tongue skinks, five species of goannas, four species of frogs, and a host of gecko species, one of which looks like red rocks. They will all serve to give visitors to the ROM a feeling for the untamed "down under".

Robert W. Murphy is assistant curator in the Department of Ichthyology and Herpetology.

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Culture and Sports

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JOHN REEVES

What can the ROM and Team Canada really do for each other?

Sandra Shaul

HOW many times can I knock on their doors?" This is the question that Eddie Goodman, chairman of the Board of Trustees of the Royal Ontario Museum was asking fellow board members and the ROM staff with increasing frequency. The answer to this question helped to provide the foundation for an exciting and unique new partnership between two of Canada's truly outstanding institutions, the Royal Ontario Museum and Hockey Canada, the governing body of Team Canada.

The doors to which Goodman was referring belong to corporations and "old boys" who have generously supported the Museum, particularly in recent years during the major renovation and gallery development program. The chairman realized that apart from such special projects, the institution's critically important ongoing operations of field work, research, and acquisition also had to be made financially secure, and to accomplish this the Museum's base of support had to be broadened. Most funds for such operations traditionally come from government and private foundations, but recent cutbacks are now jeopardizing these sources. It has become apparent that the ROM will have to adopt the entrepreneurial attitudes and skills of profit-making commercial corporations to assure the future of its essential activities. To enlarge its revenue base, the Museum requires a broader market, and this can be achieved by raising the institution's profile.

Two people who can appreciate the potential of a partnership between the Museum and Hockey Canada are T. Cuyler Young, Jr, director of the Royal Ontario Museum (left) and Murray Costello, president of the Canadian Amateur Hockey Association (right). Young is wearing a Team Canada jersey and Costello is wearing a ROM/Team Canada top. The setting is the Bishop White Gallery at the ROM.

It is this thinking that has led to the partnership between Hockey Canada and the ROM, an association that not only promises to benefit both institutions financially, but is also a natural union of seemingly divergent interests. The idea for the partnership with Hockey Canada was conceived during a meeting between Eddie Goodman and Robert Howard, head of the ROM Development Trust. In the commercial world during the past few years, there have been numerous joint corporate ventures that have succeeded in enlarging markets by raising corporate profiles through the association of seemingly unrelated products—think of gasoline and fast foods. But what do a museum and a hockey team really have in common?

One has to start by looking beyond the specific institutions to the broad aspect of sports and intellectual culture. It is easily argued that both enrich our lives and are essential to that stage of human social development that we call civilization. As ROM director and archaeologist T. Cuyler Young, Jr points out: "The concept of striving for the combination of perfect mental and physical fitness was an important part of Greek philosophy over two thousand years ago. Museums and other cultural organizations are in the business of toning the mind and sports are in the business of toning the body. Because this toning is essential to society, there is no dichotomy, and any society that disagrees is in trouble."

Culture-vultures and die-hard jocks are equally guilty of cheating themselves and others by refusing to explore a wider variety of things that life has to offer. Breaking down the barriers created by the two groups is a goal shared by the Museum and many prominent members of the hockey community. And it is agreed that a more open attitude to sports and culture can be instilled most successfully in young players and Museum visitors.

Dave King, coach of Team Canada, and a former university coach and high school teacher, says: "People with varied interests are easier to work with in an instructional setting. They seem to be able to put sport in perspective for themselves. They put forth the required effort to develop their skills and yet they realize that other elements in their development are important as well. They combine education and sports in such a way that they pursue excellence in both areas." Furthermore, when one considers how few of the thousands of kids who play amateur hockey actually will have the opportunity to play professionally, King says: "One begins to realize that the development of the total person is the goal that parents must assist their children to achieve."

A good deal of Robert Howard's time outside the Museum is spent as a coach in the Metro Toronto Hockey League. "Playing hockey can be a great experience for a youngster," he believes, "but there is also no reason why kids shouldn't feel quite comfortable about playing hockey well and learning about our country and heritage. We are always pleased to find that many of our players love to visit the Museum."

Playing hockey and visits to the Museum have traditionally given young Canadians special ways to learn about social groups and how to function within them. The importance of these learning experiences is recognized by adults who are closely associated with hockey and the Museum. According to Murray Costello, president of the Canadian Amateur Hockey Association, "If ninety-five per cent of the coaches and senior staff of the CAHA were asked why they were involved, they would answer that when they were young, someone outside of their home shared a special interest with them and they would like to do the same." Ask many of the ROM staff and the board how they feel about their involvement with the Museum and its visitors, and their answers will be identical.

Can individuals truly be as diverse in their interests and activities as we would like to think? Ken Dryden is the most publicized example of such a person, and there are others. Murray Costello started his career as a professional player, moved to the administrative side of the game, and then at the age of forty went back to school to study law. After graduation he worked for the CRTC, but he also volunteered for the CAHA, which led to his appointment as president.

Opposite page:
Young hockey players and the Museum stand to benefit most from the ROM/Team Canada association. To guarantee their futures is to continue the fine work and traditions established by the founders of the Canadian Amateur Hockey Association and the ROM.

JOHN REEVES

The era of goon hockey appears to be drawing to a close.

HOCKEY TODAY MAGAZINE

Sam Pollock was vice-president and general manager of the Montreal Canadiens until the team was sold in 1978. His association with hockey is now in a voluntary capacity as chairman of the International Committee of Hockey Canada. While touring with the Canadiens, he took advantage of the opportunities to visit museums and galleries in the various cities where the team played. This led to an interest in historical Canadian art and art books, of which he now has outstanding collections. As a further diversification of his interests, he has also developed a prize-winning herd of Jersey cattle, a hobby that he pursues at his farm in the Eastern Townships of Quebec.

The Museum will have to be innovative to sell itself to the sports public. In addition to publicizing the ROM/Team Canada partnership in various hockey publications, the Museum is considering several different proposals. One is to offer free tours of the Museum to CAHA hockey teams from outside Toronto when they are in the city for a match. Visiting players rarely see more than the arena in which they are going to play, and so a visit to the ROM would give them a little more feeling for the city. Some of our travelling exhibitions may be sent to tournaments outside the city. We may even be able to persuade certain Team Canada and NHL players to conduct a few tours, and some Museum curators are already presenting ideas for sports-related exhibitions.

As the ROM promotes the partnership with Team Canada in order to imprint more firmly in the general public's eye the idea of museum visits as an enjoyable leisure-time activity, and thus to compete more vigorously for recreational dollars, Team Canada and the CAHA see their affiliation with the ROM as a way of changing their own public image. It is no secret that the goon tactics that began to dominate the NHL games in the '60s and '70s definitely diminished the prestige of the game. The association of hockey and the ROM will hopefully encourage children and adults not only to broaden their interests but also to appreciate hockey once again for, in Dave King's words, "its speed, finesse, quick decision making, and physical toughness". For the last item read stamina not brutality.

If the marketing of the ROM/Team Canada association does succeed in promoting the common purposes of sport and culture, then the fund-raising campaign should find itself on solid ground. Sam Pollock is delighted with the partnership, which he sees as "an excellent vehicle for creating in young Canadians an interest in sports and the fine arts, as well as insuring the future and prestige of Canadian hockey and the ROM internationally."

The first commercial co-venture is the sale of very striking sweatshirts, which are now available in three different designs and which bear the ROM and Team Canada logos. Think of them as cachet items that tell people what you think rather than what you earn. All proceeds from sales will be divided equally between the Museum and the Olympic hockey team. Through this campaign and others the prospects and high standards of two great Canadian partners will be enhanced.

Sandra Shaul is executive editor of Rotunda.

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John Reeves

Wearing the ROM/Team Canada tops are: (*top row*) two ROM/Team Canada fans; (*bottom row left to right*) Eddie Goodman, Chairman of the Board, ROM; Nicole Eaton, Board of Trustees, ROM; Veronica Tennant, Principal Dancer, National Ballet of Canada; Peter Widdrington, President and CEO, John Labatt Limited

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EVOLUTION OF BIRD SONG

Birds Have Culture Too

Where does that bird come from?
Why just listen to its accent.

Allan J. Baker

IT is odd how often the careers of scientists are changed or refocused by quirks of fate. Eight years ago I was temporarily marooned on Chatham Island, a small speck of land situated in the Pacific Ocean about eight kilometres east of New Zealand. I was waiting for the weather to improve sufficiently to allow me to hitch a ride on a fishing boat to a neighbouring island where I could study a rare shorebird, the Chatham Island oystercatcher.

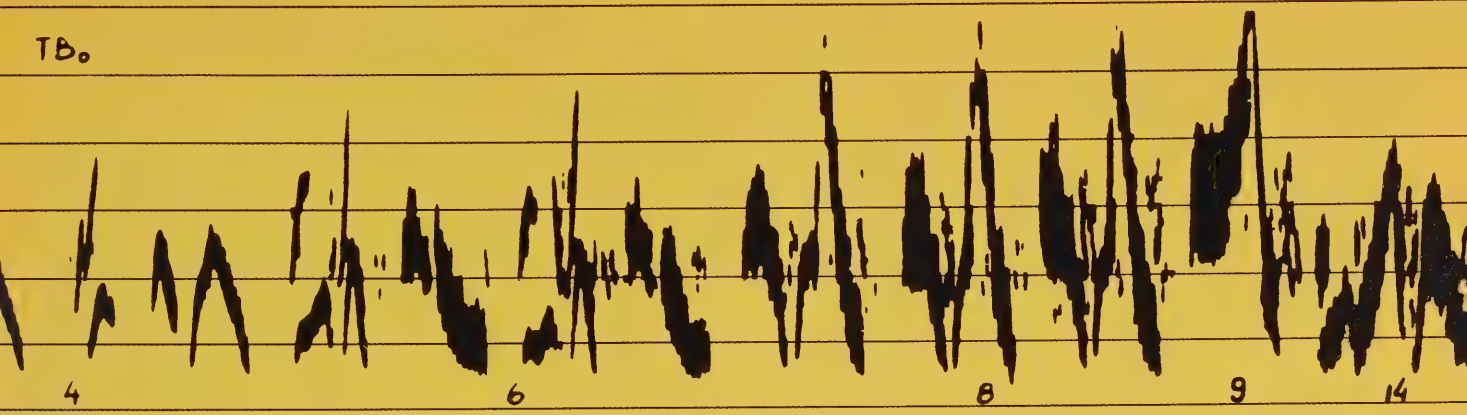
As Chatham is far off the tourist path, there was very little accommodation available, but I was very fortunate to find a place to stay in Taiko Camp, thanks to an old friend of mine, David Crockett. The camp was named after the Maori word for the magenta petrel, a seabird thought to have become extinct last century. David had persevered for many years against mounting financial odds and ornithological scepticism in his search for a few present day survivors of this species, and a year before my visit he and his field party had been thrilled to finally catch, band, and release a living taiko.

The first night I was in camp we began a watch on a headland where a strong light and a large net had been set up to attract and capture petrels, which come ashore to their breeding sites when they can escape the attention of daytime predators. The night was cold, dark, and misty, the ideal conditions for attracting birds flying in low from the sea. Within an hour we sighted the white underwings of a petrel in the light, and quickly directed it into the net by dazzling it with strong spotlights. To our amazement the bird turned out to be a taiko; I felt very lucky and privileged that night to see one of the rarest birds in the world.

The next week we were again excited when another taiko was caught, but I was becoming restless to begin my study of the oystercatchers. My principal goal was to record the calls and courtship songs of the Chatham Island species, and to compare them with other species of oystercatchers that I had studied

Opposite page: The common chaffinch that is found on Madeira is a close relative of the British chaffinch, a population whose songs have been studied extensively. The bird is shown here against a background of sonograms, which are printed visual displays of the songs.

TB0



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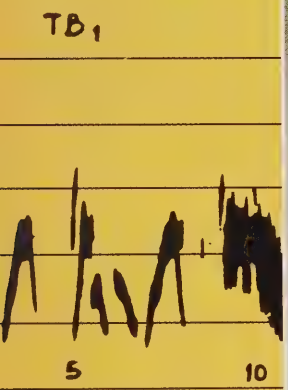

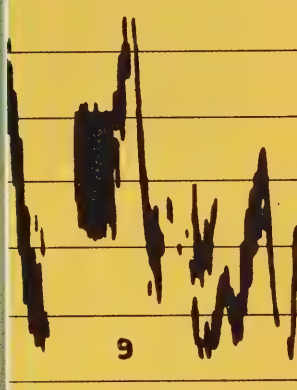

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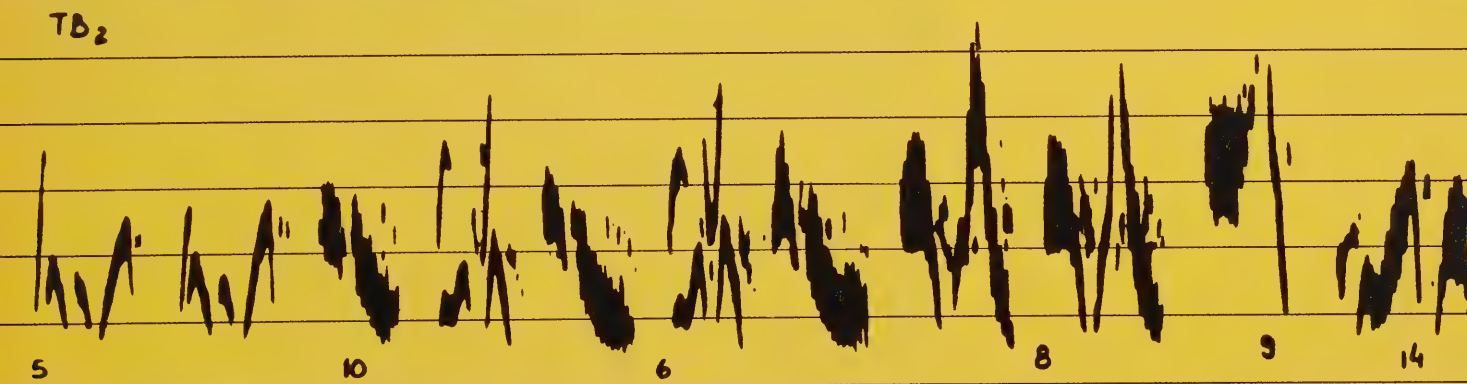

The taiko is one of the world's rarest birds. This taiko was photographed and examined after having been banded.

around the world. While I waited impatiently at the camp I decided to test my new tape recorder and parabolic reflector by recording the songs of chaffinches, which were abundant in the surrounding forest. This was the quirk of fate I alluded to earlier; from that time I became fascinated with the different song traditions or dialects possessed by populations of chaffinches in different parts of the world, and—what is more important—this has led to investigations of the processes that have produced these traditions.

It may sound unusual to speak of the songs of chaffinches in a local population as traditions. However, young males learn to sing by copying songs sung by adult males, and in this way songs in an area are transmitted from generation to generation. Although we are accustomed to thinking of culture exclusively in terms of human behaviour, a less anthropocentric view of life makes it apparent that many animal traditions transmitted by learning to subsequent generations also qualify under the general rubric of culture. The change in behavioural traditions through time is referred to as cultural evolution.

The means by which young chaffinches learn their songs have been explained by some ingenious laboratory experiments conducted by Professor W. H. Thorpe at Cambridge University in the 1950s. Thorpe discovered that the songs of young birds raised in the laboratory in acoustic isolation never developed beyond a rudimentary collection of chirps and rattles. The solitary animals, who had never heard another chaffinch sing, were classified as Kaspar Hauser birds.

For the record, Kaspar Hauser was a dumb, helpless, and bewildered German boy who appeared mysteriously in Nuremburg in 1828. It was alleged that he was the illegitimate son of the Grand Duke Charles of Baden, and that he had been kidnapped early in life and raised in strict isolation by a peasant family. Although this story is now largely discredited, the name is commonly used for animals raised in isolation from their species.

If the Kasper Hauser birds are raised in a group, they are able to learn more complex songs, but these still lack the detail and organization of the songs of wild birds. Scientists have deduced that young chaffinches learn to sing properly by comparing their formative renditions with songs sung by adults, probably via a song template in the brain. The derogatory term "bird brain", implying low intelligence or scattered wits in the object of scorn, is clearly a misnomer in light of recent discoveries on the complexity of this organ.

Brilliant research by Dr Fernando Nottebohm and his colleagues at Rockefeller University in New York has shown that the centre of song control in the brain of songbirds grows considerably larger each year while the birds are learning or remembering how to sing. At the end of the singing season, this

Allan Baker used a parabolic reflector and a tape recorder to capture the songs of oystercatchers on Chatham Island.

Left: Chatham Island oystercatchers watched anxiously as Allan Baker photographed them from the vicinity of their nests and eggs.

brain centre shrinks back in size and is replaced by other brain tissue. If only we could make computers perform in this way we would never have to buy memory expansion boards.

Songbirds apparently do not continue to learn new songs throughout their lifetimes; instead, learning is confined to their earlier days, which scientists refer to as the sensitive period. Young chaffinches learn to sing the fine details of adult song by the time they are about thirteen months old. Further experiments by Professor Thorpe have demonstrated that birds taken as nestlings in the summer could be tutored with tape-recorded songs by the autumn and again in the spring. By spring they could reproduce these songs with great accuracy. When Thorpe attempted to tutor young birds not caught until the

This is the town of Santa Cruz de Graciosa on the island of Graciosa in the Azores. Chaffinches are extremely abundant on all of the islands of the Azores and they may be found even in such urban settings.

autumn, they had difficulty learning anything other than the normal songs of wild birds, which suggests that some learning had occurred before they were caught. The general form of songs is learned by the first autumn, and is perfected the following spring. The chaffinches quickly acquire a repertoire of one to six songs by copying from one or more neighbours.

These intricate details of the singing habits of chaffinches have been discovered only in the last thirty-five years thanks to the introduction of high-fidelity tape recorders and electronic song analysis machines called sonagraphs. A sonagraph converts the tape recording of a song into a printed visual display of sound frequency over time called a sonagram. Songs that are difficult to tell apart by ear can often be clearly distinguished by sonagrams.

When I played my recordings of the chaffinch songs from Taiko camp to a colleague at the University of Auckland in New Zealand, he went into raptures over them and rushed off to run them through his sonagraph. Thus began my collaboration with Dr Peter Jenkins, which has endured until this day, fuelled by our insatiable curiosities about cultural evolution in isolated populations of birds.

Earlier Peter had published a classic study of song evolution in nearly flightless birds called saddlebacks, which are among the world's most attractive songsters. He had the foresight to record the cultural history of a new population liberated on a small offshore island. He resolutely followed this population for several years and actually recorded cultural changes occurring in songs. He discovered that new songs originated from young birds' copying errors, and eventually these mistakes were copied intact by a new generation of birds thereby establishing a new song tradition.

Unlike the saddlebacks, which were relicts (species existing in a primitive form) in the New Zealand avifauna, chaffinches were introduced last century by settlers from England as they sought to make their new surroundings resemble more closely the country they had left. Peter and I decided to record songs of chaffinches at several different sites in New Zealand to compare them with the Chatham Island population, which had originated in New Zealand. We realized that we had a golden opportunity to gain rare insights into the process of cultural evolution in populations that have been separated for more than one hundred years from their ancestors in England.

Previous studies of chaffinch song by Professor Peter Slater in Stanmer Great Wood in Sussex, the place where some of the New Zealand colonists were originally trapped, had shown that most song types did not persist beyond seventeen years. Even in this short period, many song types became extinct because young birds failed to copy them or because they were altered by rearrangements of their constituent syllables. Cultural evolution is thus much faster

Allan Baker is holding a common chaffinch just before it was banded and then released.

than genetic evolution because cultural mutations (copying errors) occur much more frequently than do genetic mutations.

To get around this problem we decided to cut up the sonagrams of each New Zealand song type so that we could attempt to classify the syllables. Two years, fifteen thousand songs, and countless grey hairs later, we finished the task. We then repeated the procedure on the same number of songs recorded from ancestral chaffinch populations in Great Britain. The analysis of the enormous quantity of data is now beginning, but we already know that New Zealand chaffinches possess only a subset of the syllables present in British populations today, and that the Chatham Island birds have only a subset of the New Zealand syllables. Many of the New Zealand syllables are also found in the source populations in southern England, and therefore we know that syllables can be transmitted and preserved for at least one hundred years. New Zealand birds have distinct accents due to numerous small errors in copying syllables. Parallels can be drawn with human culture here; think of the changes in the English language that have taken place in countries that were formerly British colonies.

This research raised the question of how long the vocal traditions of bird cultures can persist without radical change. To answer this question I turned my attention to some remote and beautiful islands in the Atlantic Ocean—the Azores, Canaries, and Madeira. These islands are volcanic and are much younger than the nearby continents of Africa and Europe. Chaffinches from Africa are thought to have colonized the Canaries about a million years ago, and then spread northwest via Madeira to the Azores.

Along with two of my Ph.D. students, Alejandro Lynch and Michael Dennison, I have been investigating the evolutionary changes that have occurred in these isolated populations. We have found that birds on the Azores share very few syllables with Madeira or Canaries birds—solid evidence that most syllable types last less than a million years. On two of the Canary Islands, Tenerife and Gran Canaria, there is another species of chaffinch, the distinctive blue chaffinch of avicultural fame. Tenerife is a spectacular place to carry out

A local species of Viper's Bugloss grows in the crater of El Teide.
Above right: Volcano Teide rises 3780 metres above sea level on Tenerife, Canary Islands. The high-altitude forest in the foreground is the home of blue chaffinches.
Below right: The blue chaffinch lives in the high-altitude pine forest on Tenerife, Canary Islands. This species is the nearest living relative of common chaffinches that live in the lower-altitude forests.

field work because it has the greatest height-to-area ratio of any island in the world, culminating in a 3780-metre volcanic peak. The blue chaffinches live in the stands of Canary Island pines near the top of the magnificent crater of El Teide, whereas the common chaffinches are found in different vegetation at lower altitudes.

From Alejandro's research it is known that the blue chaffinches all have very similar song types that resemble the Kaspar Hauser songs of common chaffinches. Therefore we think that Tenerife was colonized long ago by young birds from North Africa before they had learned to sing. The colonizers had no adult songs to copy when they first began to sing, and so today they have retained simple songs. We concluded that learning allowed the evolution of complexity in the songs of common chaffinches, and that this has led to the development of repertoires in this species that are missing in the blue chaffinch species. However, we still do not understand why, over the very long span of approximately one million years, the songs of blue chaffinches finally did not evolve as those in other species, albeit more slowly.

When spring rolls around again, think of our research while you cock an ear for the song of a robin or a song sparrow. More than just signs of the new season, the songs are a cultural delight.

Allan J. Baker is curator in charge of the Department of Ornithology, ROM.

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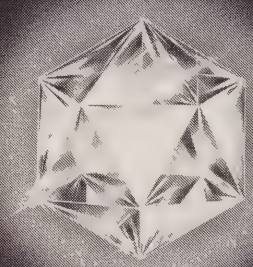

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So who needs guts to eat?

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Both the clams (top) and the vent worms (bottom) depend upon symbiotic relationships with bacteria for their food.

We wished that we could have been there inside the small sphere of the submersible, *Pisces IV,* as it hovered above a volcano fifteen hundred metres beneath the surface of the sea. Seen from the portholes of the vessel the surroundings were dark, cold, and eery. Fluids heated deep within the earth spewed out of cracks and chimneys into the cold ocean depths. The cold and hot waters shimmered as they swirled together before the floodlights of the submersible. However, being able to watch this scene and others on video tape in the comfort of our office wasn't bad either.

Half-metre-long vent worms are some of the strange creatures that live in the ocean depths. They stand in tubes situated on the tops and sides of the vents of deep-sea hot-springs.

The worms definitely aren't your ordinary garden variety. They survive in an environment where most other living things would perish. Hot water containing high levels of dissolved sulphur, which is poisonous to most animals, flows from the vents and mixes with the cold water of the surrounding ocean. Oxygen, essential to many life processes, is only present in the cold water; the sulphur in the hot water absorbs oxygen, which then makes the oxygen inaccessible to all plants and animals. Furthermore the environment has only minimal amounts of food and no light, and is under pressure from water more than a kilometre in depth.

The ability of the worms to live in this habitat is most remarkable. However, what is even more peculiar about these animals is that they have no mouth, no gut, and therefore no obvious way to eat and digest the little food that is available. How are the worms nourished?

Vent worms depend upon a species of bacteria that also thrives in an environment with no light, little oxygen, and high sulphur concentrations. The bacteria live in an organ of the vent worms called the trophosome (food body) and it is here that the bacteria use sulphur to produce organic molecules, which are food for the worms. The relationship of the vent worms and the bacteria is a symbiotic one; that is, a relationship of two different organisms or symbionts that are dependent upon each other for survival.

Most animals eat food that they gather from their surroundings. The food is then digested in the gut. Digestion means converting the food into molecules small enough to be absorbed through the walls of the gut into the bloodstream where they can be transported to all the body cells in order to provide sustenance. In the case of the vent worms, the bacteria uses sulphur to produce the food molecules within the worms. The food molecules are then absorbed from the trophosome into the bloodstream.

There are animals that live in the shallow sea-bottom mud that also have symbiotic relationships with bacteria. Awning clams burrow into mud containing a lot of decaying organic material with high levels of sulphur. The bacteria live in the gills of the clams, and they, like the bacteria in the vent worms, use sulphur to produce food.

As you can see, not all animals need guts to eat. Symbiotic relationships are one way in which invertebrates can survive without guts and mouths, and in unusual environments.

KATHRYN COATES
SHEILA BYERS

Visiting the Art Museum
Laurene Krasny Brown and Marc Brown
Fitzhenry and Whiteside
$17.95 32 pp. (cloth)

Reviewed by Ruth Freeman, Co-ordinator, Discovery Gallery, ROM

This charming and amusing book is suitable for young children and their parents. For children it presents an entertaining story attractively illustrated in full colour. For parents it demonstrates how to conduct a successful family outing to a museum. Guidelines are presented in the section "Tips for Enjoying an Art Museum" and there is useful information about the museum objects reproduced in the book.

During a typical family trip to the museum, the children express initial reluctance, occasional restlessness in the galleries, gradual interest in and genuine fascination with the objects on display, and eventual eagerness to return for another visit. The antics of the youngest child, the realization by all that grown-ups often react to museum objects and to museums in the same way as children, and the lively dialogues are humorously described. It *is* funny to compare a sculpture of an ancient Greek athlete throwing a discus to "a nude frisbee player". Yet it is this very ability to make familiar associations and to feel confident in expressing ideas and observations that makes a trip to the museum a pleasurable experience.

By accurately reproducing objects from a broad range of styles and periods, the authors have created a vibrant contrast to the casual tone of the main illustrations. This technique highlights the importance of seeing original pieces in the museum setting. As a boy in the story comments: "These are the real thing."

Dear Dr ROM,
How do birds chew their food? Do they have teeth?
Jeff T.
Willowdale, Ont.

Dear Jeff,
Good question! Birds do not have teeth. Instead, they swallow little bits of dirt and small stones which help grind up the food inside them.

If you have a question for Dr ROM, write to: Dr ROM
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MUSERS' QUIZ

Unscramble these mixed up words
(Hint: They are all found in "So Who Needs Guts To Eat?")

1. USTG _____
2. MCAL _____
3. PURULSH _____
4. AAIECRBT _____

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▶ A bowl and bread-tray, two sterling silver pieces of exceptional quality and historical value, have recently been given to the Royal Ontario Museum. They are two of four original table centrepieces handcrafted in an art nouveau style by silversmiths at Henry Birks & Sons, Montreal in 1903. They were presented that year by Mr Walter H. Aldridge to the wives of men associated with the first smelter built for the silver mines near Trail, B.C.

Mr Walter H. Aldridge was in charge of the C.P.R.'s Canadian Smelting Works, a predecessor of the Consolidated Mining and Smelting Company of Canada, now Cominco Ltd. He had them engraved with the following inscription: "FIRST SILVER/MINED SMELTED/REFINED AND MANUFACTURED/IN CANADA/HENRY BIRKS & SONS/ 1903". The different stylized, mixed floral motifs that decorate each piece are embossed and chased.

The silver came from a mine near Trail, B.C., and after being refined at the Trail smelter, it was shipped by rail to Birks in Montreal for handcrafting by the silversmiths. It is likely that one craftsman shaped the objects, another decorated them, and a third engraved them.

HONOR DE PENCIER

Silver bread-tray, manufactured by Henry Birks & Sons, Montreal, 1903. Originally presented to Mrs Thomas Gibbs Blackstock. Gift of Mrs Lesslie R. Thomson in memory of her mother Mrs T. G. Blackstock. Canadian Decorative Arts Department, ROM

Silver bowl, manufactured by Henry Birks & Sons, Montreal, 1903. Originally presented to Lady Van Horne. Gift of Mrs William Van Horne of Montreal in memory of Mr F. St. George Spendlove, curator of Canadiana from 1952 to 1962. Canadian Decorative Arts Department, ROM

The Astrocentre in the McLaughlin Planetarium

The vastness of our galaxy and some of its dazzling and awesome cosmic constituents have been brought down to earth in a new, animated gallery called the Astrocentre in the McLaughlin Planetarium, which opened on 6 December 1986. Located on the second floor of the Planetarium building, this permanent high-tech gallery is constructed on a grand scale. Only one other astronomical gallery in Canada is comparable in size to the Planetarium's spacious 632-square-metre facility.

Wall panels, many of them six metres or more across, surround visitors with spectacular blown-up images of the planets, sun, stars, and galaxies. No matter where one turns, one is face-to-face with a visual feast comprising some of the most majestic sights in our universe. Interactive displays and participatory experiences put fascinating astronomical information at the visitors' fingertips. Artifacts dating as far back as 206 B.C. will show astronomy as a universal human endeavour that has spanned time and cultural boundaries. Two- and three-dimensional displays and computers explain theories about how the universe evolved, how it's explored, and how physical forces operate within it. The gallery addresses subjects of current interest and includes a fifty-seat mini-theatre for topical slide shows and lectures.

One of the gallery's chief attractions is a solar telescope. This allows the visitor to observe the sun as it appears that very moment, in an image conveyed by means of a mirror device set on the Planetarium's roof. The sun's prominences—powerful eruptions that reach hundreds of thousands of kilometres into space—can be viewed through an eyepiece by means of the red light of hydrogen atoms. Although there are two other solar telescopes in Canada, both of them are white light telescopes that don't offer this dramatic eyewitness experience. A nearby TV monitor shows solar footage from other days to compensate for times when the sun is not visible.

Another unusual attraction uses lighted pathways on an eight-metre-wide wall to convey the speed with which the nine planets and their larger moons orbit the sun—and each other. This interactive, two-dimensional orrery allows visitors to select those of the fifteen largest bodies in the solar system about which they would like to learn more.

One of the Astrocentre's many exciting series of wall panels that explain the nature of our galaxy.

BRIAN BOYLE

Nearby, Planetarium-goers can experience the differences in gravity on the surfaces of four planets by lifting a series of milk cartons. The difference between such rocky terrestrial planets as Mars and giant gaseous bodies, such as Jupiter, is the focus of an enormous backlit photographic display. A related display explains such earth-moon-sun phenomena as eclipses, phases of the moon, the seasons, and tides.

Eight hundred pinpoints of light, accurately representing the region around the sun, will sparkle in a rotating display that has few parallels. This breathtaking, three-dimensional stellarium, built by Jeff Carl of the California Academy of Sciences, is two and a half metres in diameter—the largest of three such models in existence. It demonstrates dramatically how different types of stars are distributed in space.

In the section of the gallery which deals with the formation, evolution, and eventual death of different types of stars, one can learn how a white dwarf or a black hole forms. Another interactive element in the gallery is a control panel where visitors can select points of interest in the Milky Way galaxy. Two computer terminals, intended to accommodate both adults and children, allow visitors to seek out more in-depth information.

The human search to understand and track the stars, measure time, and predict the seasons is illustrated in the section "Tools of Earlier Skywatchers". There is a sundial used to tell time during the Han dynasty (206 B.C. to A.D. 25) in China; a brass astronomical quadrant of the type used by French engineers in the later days of New France; a calendar made in Germany in 1694, and other such devices. By bringing the vastness of our galaxy down to earth, the Astrocentre hopes to give visitors an experience that is out of this world.

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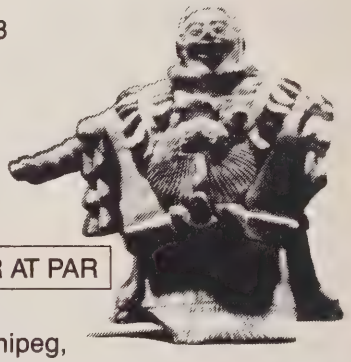

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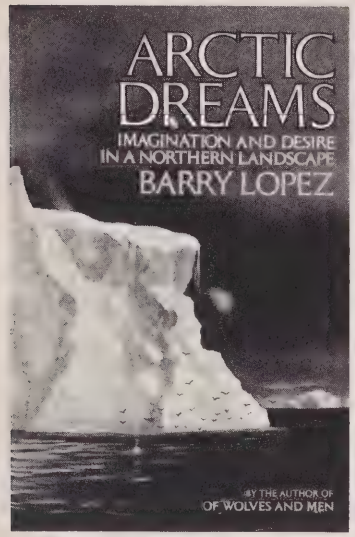

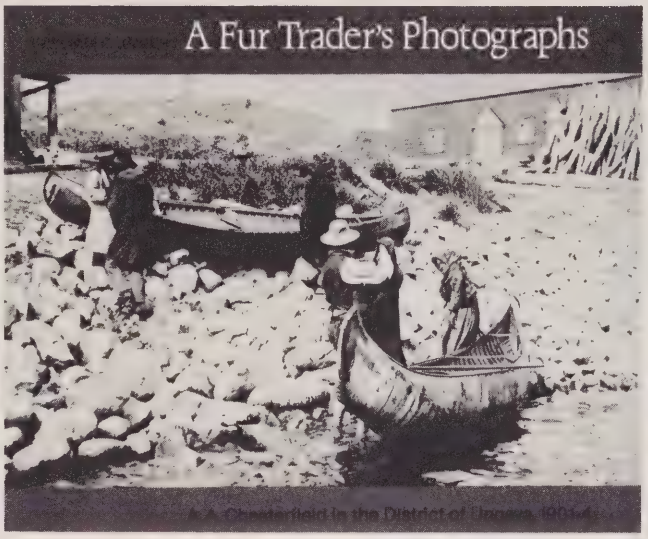

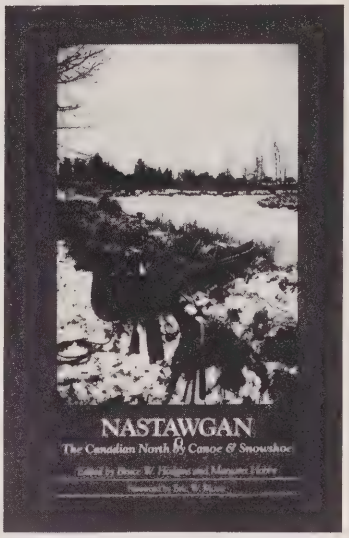

Arctic Dreams
Barry Lopez
Collier Macmillan Canada Inc.
464 pp. $33.95 (cloth)

A Fur Trader's Photographs: A.A. Chesterfield in the District of Ungava, 1901–1904
William C. James
McGill-Queen's University Press
113 pp. $24.95 (cloth)

Nastawgan: The Canadian North by Canoe & Snowshoe
Edited by Bruce W. Hodgins and Margaret Hobbs
Foreword by Eric W. Morse
Betelgeuse Books in co-operation with the Ontario Recreational Canoeing Association
231 pp. $29.95 (cloth)

Three books about the North reviewed by Marilyn Walker, ROM

Arctic Dreams is an entrancing book for anyone, specialist or layman, whose mind has ever been filled with visions of the northern landscape, real or imagined. Lopez approaches his subject with the eye of the landscape painter, capturing the hues and tones of the northern landscape with its breathtaking beauty and elusive mystery, and interweaving history with imagination, action with expectation, and poetry with science.

While recognizing that the North is in a state of rapid change, Lopez prefers, he says, to focus not upon contemporary issues, but rather on broader questions, such as: "How do people imagine the landscapes they find themselves in? How does the land shape the imaginations of the people who dwell in it? How does desire itself, the desire to comprehend, shape knowledge? These questions seemed to me to go deeper than the topical issues, to underlie any consideration of them."

Chapters on the history of cartography, Eskimo prehistory, and ice and light and arctic animals become a search for underlying meanings. Lopez's ability to move so easily from factual detail to the essence of meaning is a particularly noteworthy feature of this book; since much of the factual material is readily available in other sources. We read of polar bears diving to the ocean floor for mussels and kelp, and then of a whaling captain who, on an idle summer afternoon in 1896, shot thirty-five polar bears for sport. Europeans, Lopez tells us, were "ill at ease in the Arctic. The polar bear was for them a symbol of the implacable indifference of an inhospitable landscape." In contrast, the Eskimos felt a special affinity with the bear and held it in high esteem.

The history of Europeans in the Arctic becomes an examination of the meaning of exploration. Lopez interprets the history of northern exploration as the record of human longing for unknown riches, fame, and most of all, significance. The Arctic was seen by Europeans as something to overcome, a wasteland fixed in time, "a painting inhabited by attenuated people," and ultimately as without meaning until defined by an assignment of ownership. With notable exceptions, the Eskimos were seen as socially and morally inferior, and their knowledge dismissed as useless anecdotes, despite their long-lived and essential intimacy with the land.

From the earliest exploration to the mining and oil camps of the present day, Lopez finds the same attitudes persisting—that the Arctic is too vast to be hurt, that the Euro-Canadian presence is inherently right and for the common good, and that Euro-Canadian arrogance is justified even in the face of ignorance.

The richness of the prose and its strong visual sense (no photographs are included, nor are they necessary) can perhaps enable the reader to forgive the author an occasional self-indulgence, such as the description of the movement of the musk-ox as "oriental", and its pose as "meditative". But there are other features that are not so easily ignored.

Any reader who wants to check

original sources for some of the descriptions will be frustrated by such references as "a young archaeologist," or "wrote one captain". The habit of not calling Eskimos by their names except when quoting from published sources adds to the dream-like quality, but it also reinforces the anonymity that native people have been subjected to in European and Euro-Canadian accounts. And the book does little more than hint at the apparently less poetic sides of everyday life, personalities, and emotions.

Nevertheless Lopez conveys a profound respect for the Eskimos and their relationship to the land. This is a book to savour with its evocative, poetic, and sometimes spellbinding imagery, and a book to ponder with its search for meaning and its cautiously optimistic hope for the future.

❦

William C. James is a faculty member of the Department of Religion at Queen's University. It was here that he accidentally came across A. A. Chesterfield's collection of photographs and discovered that, with a few exceptions, they were unpublished. The photographs published in this book are a selection of Chesterfield's work from 1901 to 1904, which he produced when he was employed as a fur trader with the Hudson's Bay Company. Chesterfield lived and worked with the Cree and Inuit at Moose Factory, Great Whale River, and Fort George, and in his spare time he recorded their traditional life as well as the effect of contact with Euro-Canadian culture.

James has used the photographs as a primary source of information rather than as supplementary to his text, and he has enhanced many of them with stories and background information provided by Cree and Inuit now living at Great Whale River. He also analyses the photographs for meaning that increases their impact upon the reader—meaning that the casual reader would probably otherwise miss.

James quotes from several articles by Chesterfield. Some of the quotes

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reveal Chesterfield's attitudes, which at times appear to be contradictory to the sensitivity conveyed in the photographs. In one excerpt, for example, Chesterfield stated:

> It is Indian nature to seek guidance from a superior being, especially if spoken to in their idiomatic speech, and both traders and missionaries learned the native languages. This appealed to Indian vanity.

The source of the quote is an article written almost forty years after the pictures were taken. Perhaps, as James suggests, it was an attempt to rationalize the massive changes in northern life of which Chesterfield was a part. In contrast, the photographs reveal an awareness of the impact of trading-post life on the Cree and Inuit, and of the threat to the native way of life.

The most appealing photographs are the portraits of Inuit and Cree men and women both as individuals and in groups. Chesterfield never photographed the Inuit and Cree together. The portraits show particularly a directness, a trust, and an openness between photographer and subject, and they portray a wider range of emotions and expressions than is normally seen in collections of similar photographic subjects. In particular, as James notes, there is an absence of contrived backgrounds and of the extraneous artifacts typical of Victorian studio portraiture. However, native home life is not represented. The collection tells a story of life at the trading post; home, at this time in history, was still some distance away.

Chesterfield's photographs are revealing about Inuit and Cree life, as well as about the relationship between the photographer and his subjects. James's text is readable and also revealing, and it is an important documentation and enrichment of the photographs.

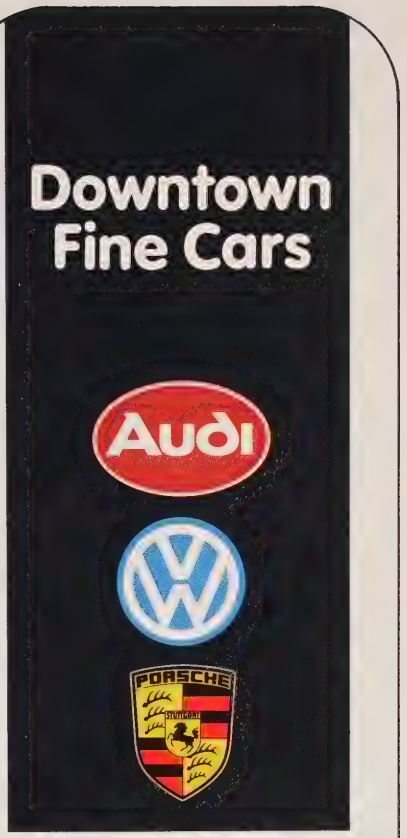
❦

Nastawgan is a collection of sixteen essays on recreational wilderness travel. The book summarizes early exploration in the North, the development of recreational canoeing, and the history of northern travel. But the reader can expect much more than a straightforward recounting of historical events, for *Nastawgan* is also a search for meaning and motive. The North and the wilderness are an essential part of Canadian heritage, but it is the North as a philosophical quest (and the canoe as a means of exploration) that is the underlying theme of the book. Nastawgan is an Anishinabai word meaning "the way or the route one must take to get through the country". The essays are varied in approach and subject matter.

Gwyneth Hoyle's "Women of Determination" brings to light the little-known stories of eight women who travelled north for recreational or exploratory purposes. One of them was Elizabeth Taylor, who was listed in the 1908 American government list of great explorers; another was the mysterious Russian immigrant, Lillian Alling, who set off on foot from New York for Siberia in 1927. George Luste's "History, Travel and Canoeing in the Barrens" examines the relationship between Europeans and natives. Margaret Hobbs's "Purposeful Wanderers" examines the travel and motives of Warburton Pike, the Tyrrells, and others who, less than a century ago, were well-known travellers, and concludes that "Although determined to escape civilisation, these wilderness-seekers unavoidably carried their class baggage with them. Ultimately, they represented the forerunners of modernity, and remained imprisoned within an inherited cultural value system which was predominantly white, genteel, and urban."

The most thought-provoking of the essays is "The Quest Pattern and the Canoe Trip" by William C. James. It sets the tone for many of the essays in the book by viewing the canoe trip as a quest for "transformation of attitudes through a kind of indigenization".

Nastawgan is a book that is bound to infuse any wilderness experience, real or imagined, with new meaning and value. ❦



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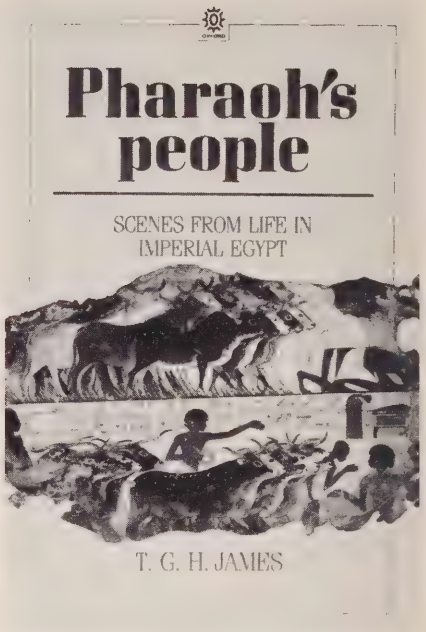

Pharaoh's People: Scenes from Life in Imperial Egypt
T. G. H. James
Oxford University Press
282 pp $14.95 (paper)

Reviewed by Krzysztof Grzymski, assistant curator, Egyptian Department, ROM

Twice during the last decade, Canadian audiences have enjoyed extraordinary exhibitions of ancient Egyptian art. Both "The Treasures of Tutankhamun" and "Ramesses the Great" received overwhelming attention from the public and the media, proving once again that the long dead civilization of ancient Egypt holds a special fascination. However, by focusing on the most spectacular aspects of this culture—the pyramids, monumental temples, and exquisite art—the two shows created for their publics a rather distorted view of ancient Egypt. In his book, T. G. H. James talks about the other sides of Egypt: how the country was administered and how the ordinary Egyptian lived.

In recent years there has been a proliferation of books that deal with the theme of "daily life". After exploring the monumental for so many years, scholars are now turning their attention to the mundane. The best of these publications is *Egypt's Golden Age: The Art of Living*

in the New Kingdom 1558-1085 B.C. By comparison, T. G. H. James's book is a modest undertaking, offering only glimpses into the daily life of ordinary Egyptians rather than a sweeping review of all their activities.

T. G. H. James is keeper in the Department of Egyptian Antiquities at the British Museum, and a scholar of international renown in the study of Egyptian inscriptions and papyri. Therefore it is not surprising that his text is largely based on written accounts left by the Egyptians and extensively supported by iconographic material, mostly tomb paintings. Like *Egypt's Golden Age*, the text of *Pharaoh's People* concentrates on life in the New Kingdom, although there are sources cited from other periods in history.

Three of the nine chapters of the book deal with written documents, the scribes, and literacy in ancient Egypt, but I most enjoyed the chapter entitled "Craftsmen in Metal and Wood". James's story about Egyptian artisans is based on the paintings from the Theban tomb of Rekhmire, who served as a vizir of Tuthmosis III and Amenhotep II. In the course of his duties, Rekhmire often visited the workshops at the Amun Temple, and therefore he included in his tomb decoration a detailed pictorial account of how the Egyptian artisans operated.

James is not the first to present these lovely scenes to the general reader and public. In fact the old Egyptian galleries at the ROM were decorated with a frieze based on these very paintings.

The text of the book is interspersed with numerous quotations from original Egyptian texts, many of them self-laudatory remarks by the scribes in which they note the superiority of their profession. These literary passages, mostly translated by James, add a very personal touch to *Pharaoh's People* and allow us to better appreciate the Egyptian way of thinking, including the joys and the frustrations of daily life. This is a well-written book that educates the reader in an elegant and entertaining manner.

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ROTUNDA QUIZ

It's a Game of Feet

1. Imperial measurement may be clumsy and inconvenient at times, but it has charms that metric can't match. One of them is that many of the imperial measures originated with parts of the body. The foot is obvious, but there is also the inch, based on the thumb's breadth, and the hand (four fingers breadth), which is still used to measure the height of horses. Is the foot the largest imperial measure that comes from the body?

2. One of the distinguishing characteristics of the feet is their propensity to sweat. Some observers have claimed that the resultant odour has a cheese-like quality, and in fact there is now supporting evidence for this idea. If you had to choose a variety of cheese that is associated with feet, what would it be?

3. Bigfoot, or the Sasquatch, is the legendary man-ape that is supposed to roam the forests of the Pacific North-West. The vast majority of people think it's a hoax, but a handful of scientists claim that the footprint impressions purportedly left in soft ground by Bigfoot have unique characteristics that suit them to the animal. If you were redesigning the human foot to support an upright-walking, 360-kilogram beast, what would you change?

4. What is the ratio of the circumference of an elephant's foot to the animal's height?

5. Walking on hot coals, an activity long practised in the East, has recently come to North America. Naturally it has acquired a North American flavour as well: it's a confidence-builder in self-help seminars. Does firewalking really require supreme confidence or some altered state of consciousness? What is the secret?

JAY INGRAM

The answers are on page 64.

INDEX TO VOLUME 19

Authors

Baker, Allan J.; Evolution of Bird Song: Birds Have Culture Too; Vol. 19, no. 4:42

Berg, David; Illuminations: White Collar Crime in Ancient Egypt; Vol. 19, no. 4:15

Buerschaper, Peter; Moulding a Termite Mound; Vol. 19, no. 4:30

Byers, Sheila and Coates, Kathryn; Musers: So who needs guts to eat?; Vol. 19, no. 4:50

Coates, Kathryn; Musers: What Did That Worm Say?; Vol. 19, no. 2:54;—and Sheila Byers; Musers: So who needs guts to eat?; Vol. 19, no. 4:50

Collins, Desmond; Paradise Revisited; Vol. 19, no. 1:30; The Great Anomalocaris Mystery: How a Shrimp Became the World's First Monster; Vol. 19, No. 3:51

Deans, Paul; Science on the Run; Vol. 19, no. 2:40

Durrell, Gerald; The Other Russians; Vol. 19, no. 1:20

Farley, Catherine and Pendergast, David M.; Illuminations: The Good, The Bad, and The Collector; Vol. 19, no. 2:11

Finsten, Jill; In a Manner of Speaking: The Sly Humour of Mannerist Art; Vol. 19, no. 3:38

Grant, Valerie; Illuminations: Souvenir—Art or Artifact?; Vol. 19, no. 1:13

Hood, Adrienne D.; Dorothy Burnham: Discovering Canada's Handwoven Heritage; Vol. 19, no. 1:40

Ingram, Jay; Rotunda Quiz: A Few of my Favourite Rings; Vol. 19, no. 1:60; Rotunda Quiz: On The Beach; Vol. 19, no. 2:68; Rotunda Quiz: Chestnuts Roasting on an Open Fire; Vol. 19, no. 3:68; Rotunda Quiz: It's a Game of Feet; Vol. 19, no. 4:62

Kapches, Mima; Life in the Past Lanes: An Archaeological View of Toronto; Vol. 19, no. 4:18

Keall, Edward; Bringing the Dome to Yemen; Vol. 19, no. 2:30

Kirwin, W. Chandler; Papally Yours: Masterpieces of Baroque Art from the Vatican; Vol. 19, no. 3:18

Lavallée, Omer; One Hundred and Fifty Years of Riding the Rails; Vol. 19, no. 1:48

MacCulloch, Ross; Musers: Some Ways that Reptiles Defend Themselves; Vol. 19, no. 1:58

Metsger, Deborah; Illuminations: Plant Alert: What to Watch for in the Spring; Vol. 19, no. 1:17; Illuminations: Plant Alert: What to Watch for in the Summer and Fall; Vol. 19, no. 2:16; Illuminations: Plant Alert: What to Watch for in the Winter; Vol. 19, no. 3:14; Illuminations: Plant Alert: Watch What You Wear and Drink; Vol. 19, no. 4:10

Murphy, Robert W.; Wonder in Alice-land; Vol. 19, no. 4:26

Pendergast David M., and Farley Catherine; Illuminations: The Good, The Bad, and The Collector; Vol. 19, no. 2:11

Ritchie, Barbara D.; Providential Delays and the Nobility of Rot; Vol. 19, no. 3:28

Russell, Loris S.; Exploring a Great Dinosaur Graveyard; Vol. 19, no. 2:20

Schmedding, Brigitta; A Chinese Arcadia of European Design: The Art of Chinoiserie Textiles; Vol. 19, no. 3:46

Shaul, Sandra; Culture and Sports: Museum Marketing with an Entrepreneurial Twist; Vol. 19, no. 4:37

Varley, Gloria; Illuminations: Physic in Flower; Vol. 19, no. 1:8; Illuminations: Magical Properties; Vol. 19, no. 3:10; Illuminations: Oranges and Lemons; Vol. 19, no. 4:7

Waddington, Janet; Musers: Helpful Hints for Identifying Fossils; Vol. 19, no. 3:58

Walker, Marilyn; Illuminations: What Mackenzie and Others Failed to See; Vol. 19, no. 2:12

Wilson, Nancy; Catering for the Unknown; Vol. 19, no. 2:46

Wilson, Susan; Illuminations: What are M-C-G's?; Vol. 19, no. 1:10

Young Jr, T. Cuyler; Illuminations: Value Driven, Market Oriented; Vol. 19, no. 1:6; Illuminations: The Modern Museum: Have We Lost the Wonder?; Vol. 19, no. 2:6; Illuminations: Corporate Identity and the Modern Institution; Vol. 19, no. 3:6; Illuminations: Continuous Museum Making; Vol. 19, no. 4:5

Titles

Book Reviews: *Painters and Public Life in Eighteenth Century Paris,* Thomas E. Crow; review by Jill Finsten; Vol. 19, no. 1:62; *The Men with Wooden Feet: The Spanish Exploration of the Pacific Northwest,* John Kendrick; review by Walter A. Kenyon; Vol. 19, no. 1:64; *Alahan: An Early Christian Monastery in Southern Turkey,* edited by Mary Gough; review by A. D. Tushingham; Vol. 19, no. 1:66; *The Short Log and Timber Building Book,* James Mitchell; review by Walter A. Kenyon; Vol. 19, no. 2:62; *Patterns of Power/Vers la force spirituelle,* Ruth B. Phillips; review by Barry J. Martin; Vol. 19, no. 2:65; *Engineer's Witness,* Ralph Greenhill; review by Geoffrey Simmins; Vol. 19, no. 3:67; *Arctic Dreams,* Barry Lopez; review by Marilyn Walker; Vol. 19, no. 4:57; *A Fur Trader's Photographs: A. A. Chesterfield in the District of Ungava, 1901-1904,* William C. James; review by Marilyn Walker; Vol. 19, no. 4:57; *Nastawgan: The Canadian North by Canoe & Snowshoe,* Edited by Bruce W. Hodgins and Margaret Hobbs; review by Marilyn Walker; Vol. 19, no. 4:57; *Pharaoh's People: Scenes from Life in Imperial Egypt,* T. G. H. James; review by Krzysztof Grzymski; Vol. 19, no. 4:60

Book Reviews, Musers: *Storm Child,* Brenda Bellingham; reprinted from *The Children's Book News;* Vol. 19, no. 1:59; *Looking at Plants,* David Suzuki with Barbara Hehner; reprinted from *The Children's Book News;* Vol. 19, no. 1:59; *We Celebrate Spring,* Bobbie Kalman and Karen Harrison; reprinted from *The Children's Book News;* Vol. 19, no. 2:55; *Achimoona,* introduced by Maria Campbell, illustrations by various artists; reprinted from *The Children's Book News;* Vol. 19, no. 2:55; *A New World Bestiary,* Mary Hamilton, Kim LaFave, illustrator; reprinted from *The Children's Book News;* Vol. 19, no. 3:59; *Cry to the Night Wind,* T. H. Smith; reprinted from *The Children's Book News;* Vol. 19, no. 3:59; *Visiting the Art Museum,* Laurene Krasny Brown and Marc Brown; review by Ruth Freeman; Vol. 19, no. 4:51

Bringing the Dome to Yemen; Edward Keall; Vol. 19, no. 2:30

Catering for the Unknown; Nancy Wilson; Vol. 19, no. 2:46

Chinese Arcadia of European Design, A: The Art of Chinoiserie Textiles; Brigitta Schmedding; Vol. 19, no. 3:46

Culture and Sports: Museum Marketing with an Entrepreneurial Twist; Sandra Shaul; Vol. 19, no. 4:37

Dorothy Burnham: Discovering Canada's Handwoven Heritage; Adrienne D. Hood; Vol. 19, no. 1:40

Evolution of Bird Song: Birds Have Culture Too; Allan J. Baker; Vol. 19, no. 4:42

Exploring A Great Dinosaur Graveyard; Loris S. Russell; Vol. 19, no. 2:20

Index continued

Gallery Glimpses; The Greek World, Early Italy and the Etruscans, Bronze and Iron Age Europe; Vol. 19, no. 2:56; Later Imperial China; Vol. 19, no. 3:63; The Astrocentre in the McLaughlin Planetarium; Vol. 19, no. 4:55
Great Anomalocaris Mystery, The: How a Shrimp Became the World's First Monster; Desmond Collins; Vol. 19, no. 3:51
Growing Collections, The; Vol. 19, no. 1:61; Vol. 19, no. 2:60; Vol. 19, no. 3:61; Vol. 19, no. 4:53
Illuminations: Value Driven, Market Oriented; T. Cuyler Young, Jr; Vol. 19, no. 1:6; Physic in Flower; Gloria Varley; Vol. 19, no. 1:8; What are M-C-G's?; Susan Wilson; Vol. 19, no. 1:10; Souvenir—Art or Artifact?; Valerie Grant; Vol. 19, no. 1:13; Plant Alert: What to Watch for in the Spring; Deborah Metsger; Vol. 19, no. 1:17; The Modern Museum: Have We Lost the Wonder?; T. Cuyler Young, Jr; Vol. 19, no. 2:6; The Good, The Bad, and The Collector; David M. Pendergast and Catherine Farley; Vol. 19, no. 2:11; What Mackenzie and Others Failed to See; Marilyn Walker; Vol. 19, no. 2:12; Plant Alert: What to Watch for in the Summer and Fall; Deborah Metsger; Vol. 19, no. 2:16; Corporate Identity and the Modern Institution; T. Cuyler Young, Jr; Vol. 19, no. 3:6; Magical Properties; Gloria Varley; Vol. 19, no. 3:10; Plant Alert: What to Watch for in the Winter: Vol. 19, no. 3:14; Continuous Museum Making; T. Cuyler Young, Jr; Vol. 19, no. 4:5; Oranges and Lemons; Gloria Varley; Vol. 19, no. 4:7; Plant Alert: Watch What You Wear and Drink; Deborah Metsger; Vol. 19, no. 4:10; White Collar Crime in Ancient Egypt; David Berg; Vol. 19, no. 4:15
In a Manner of Speaking: The Sly Humour of Mannerist Art; Jill Finsten; Vol. 19, no. 3:38
Life in the Past Lanes: An Archaeological View of Toronto; Mima Kapches; Vol. 19, no. 4:18
Moulding a Termite Mound; Peter Buerschaper; Vol. 19, no. 4:30
Musers: Some Ways that Reptiles Defend Themselves; Ross MacCulloch; Vol. 19, no. 1:58; What Did That Worm Say?; Kathryn Coates; Vol. 19, no. 2:54; Helpful Hints for Identifying Fossils; Janet Waddington; Vol. 19, no. 3:58; So who needs guts to eat?; Kathryn Coates and Sheila Byers; Vol. 19, no. 4:50
Musers' Quiz and Dr ROM; Vol. 19, no. 4:51
One Hundred and Fifty Years of Riding the Rails; Omer Lavallée; Vol. 19, no. 1:48
Other Russians, The; Gerald Durrell; Vol. 19, no. 1:20
Papally Yours: Masterpieces of Baroque Art from the Vatican; W. Chandler Kirwin; Vol. 19, no. 3:18
Paradise Revisited; Desmond Collins; Vol. 19, no. 1:30
Providential Delays and the Nobility of Rot; Barbara D. Ritchie; Vol. 19, no. 3:28
Rotunda Quiz: A Few of my Favourite Rings; Jay Ingram; Vol. 19, no. 1:60; On The Beach; Jay Ingram; Vol. 19, no. 2:68; Chestnuts Roasting on an Open Fire; Jay Ingram; Vol. 19, no. 3:68; It's a Game of Feet; Vol. 19, no. 4:62 Science on the Run; Paul Deans; Vol. 19, no. 2:40
Wonder in Aliceland; Robert W. Murphy; Vol. 19, no. 4:26

Answers to Rotunda Quiz

1. No it isn't. The yard, while it might be three feet today, was originally the distance from a man's nose to the farthest fingertip of an arm extended straight out to the side. And if you extend BOTH arms out, the distance from one outstretched fingertip to the other is the fathom.

2. Brie, or Camembert. The link is a pair of related bacteria. *Brevibacterium epidermidis* is a key player in the production of foot odour: in damp conditions, it breaks down skin proteins to form, among other things, methanethiol. Like most sulphur-containing compounds, methanethiol assaults the nose. A close relative, *Brevibacterium lineus*, also makes methanethiol, but from milk proteins. Cheesemakers deliberately add *Brevibacterium lineus* at the beginning of the cheese-making process, and doesn't the whole idea render Brie and Camembert just a little less pretentious?

3. Bigfoot prints, real or faked, have shown the following features:
a) They are flat. Believers say that's quite reasonable, because no arch could support that body weight.
b) The heel is much broader than a scaled-up human heel would be; again, this is for support.
c) The big toe is not much bigger than the others, and all five toes dig deeply into the ground. The argument here is that the normal human stride pattern of rolling the weight forward and finally pushing off the big toe simply couldn't work for an animal of such tremendous weight.
d) And of course the whole foot is huge: literally a foot-and-a-half.

There are other features, including some that are being kept secret in order to check the authenticity of new discoveries, but if you guessed any of the ones mentioned, you are right.

4. The ratio is 1:2; that is to say, an elephant's height is twice the circumference of its foot. I should add that I've only ever found one source for this: a 1955 children's book on animals. I've never actually measured the circumference of elephants' feet relative to their height. However, assuming that this is true, it's a neat illustration of the fact that as an animal gets bigger, its weight increases faster than the supporting surface area of its leg bones. So an elephant needs much thicker legs, relative to its body, than does an ant. I have no idea how many times around an ant's foot gives its height at the shoulder, if indeed an ant can be said to have a shoulder.

5. There might be an element of psychology to walking on hot coals. Chanting and raising your eyes skyward as you walk could make the pain less perceptible. But there is solid evidence from physics that you don't need any mental preparation at all. First, hot coals, despite their temperature, don't contain much heat energy, nor do they transfer that energy efficiently to the soles of your feet. An analogy is the air inside your oven: it's the same temperature as the cake pan, but it doesn't burn you. There is also the Leidenfrost effect: the moisture on your feet, when exposed to the heat, forms a thin insulating layer of water vapour between your skin and the coals. That same insulating layer allows water droplets to skid around on the hot surface of a skillet. So forget mental preparation. It's probably safer to walk on hot coals if you are nervous and your feet are perspiring. I would not advise anyone to try to walk on hot coals, for they are likely to find themselves suffering from more than hot feet if they do.

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